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EARL C. ELKINS, M.D.
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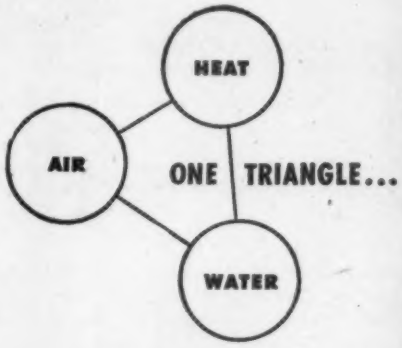

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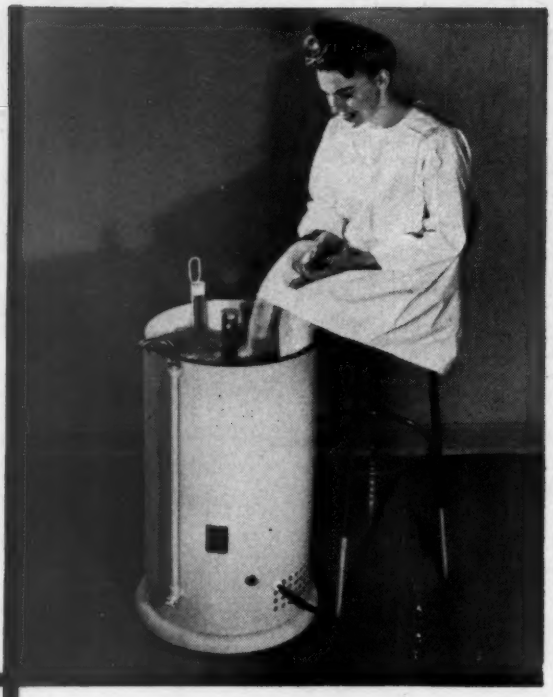

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PHYSICAL MEDICINE IN SURGICAL CONVALESCENCE *

ROBERT ELMAN, M.D.

ST. LOUIS

Physical medicine in convalescence is concerned largely with the deleterious influence of bed rest and immobilization and with the means of preventing or combating it. The most important of the deleterious effects are those which lead to pulmonary and vascular accidents. Other less obvious changes are those associated with the atrophy of disuse. More important than such anatomic effects is the loss of neuromuscular abilities, to which the term "deconditioning" is now often applied. Also associated with immobility are metabolic changes, which are poorly understood but are being carefully investigated.

Previous Observations

The virtue of rest as a therapeutic procedure is so deeply ingrained in the tradition of the healing art and has been so emphasized and extolled by the great leaders in medical thought for so long that it was almost considered heresy to describe any deleterious effects which could be directly attributed to this general procedure. Yet as long ago as 1886 Lucas-Championnière[1] eloquently denounced the evil effects of prolonged immobilization in the treatment of fractures. He expressed for the first time the belief that repair is more rapid and complete when some movement is permitted. He claimed that even pain is less with early movement because immobilization merely postpones pain, which actually is worse the longer the period of immobilization which precedes movement. He therefore advocated early mobilization and massage. It is noteworthy that he expressed the same idea twenty-five years later[2] with greater emphasis, based on his added clinical experience. The importance of early movement and other physical therapy is now widely recognized. Nevertheless there are considerable areas of surgical practice in which such treatment is inadequately used.

Early mobilization of the entire body by shortening the period of bed rest after surgical operations was first carried out in 1899 by Emil Ries,[3] a gynecologist practicing in Chicago. He described the beneficial effects of early ambulation in a series of patients who were allowed up on the first or second day after hysterectomy. This lead was not followed even by other gynecologists, for Howard A. Kelly[4] in 1911 wrote as follows: "The timid surgeon does not want to drag a miserable, depressed, suffering patient out on the floor so soon after an aggressive operation."

Yet the dangers of recumbency in older patients have long been realized by surgeons. Few would hesitate to get a patient in his 80's or 90's out of bed almost immediately after operation. The advantages of such early termination of bed rest are freely acknowledged. The deleterious effect of prolonged bed rest in the aged has been realized even in types of disease other than surgical, the evidence having been summarized very well by LaPlace and Nicholson in 1938.[5] Although early ambulation produced no deleterious results in

* From the Department of Surgery, Washington University School of Medicine, and Barnes Hospital.

1. Lucas-Championnière, J.: Bull. et mém. Soc. de chir. 12:560, 1886.
2. Lucas-Championnière, J.: Brit. M. J. 2:981, 1908.
3. Ries, E.: J. A. M. A. 33:454, 1899.
4. Kelly, H. A.: Surg., Gynec. & Obst. 13:78, 1911.
5. LaPlace, L. B., and Nicholson, J. T.: J. A. M. A. 110:247, 1938.

the aged, it was not widely used with younger patients. Most textbooks recommend, as a routine, bed rest for at least ten days after abdominal operations.[6]

A complete collective review of observations on early termination of bed rest after operation was published in 1943 by Newburger.[7] Only 44 of the 189 references cited were in English and nearly all had been published previous to 1914. With few exceptions, and those from European centers, the communications were all from nonuniversity clinics. By 1922, two English surgeons, Claremont and Rowlands,[8] stated convincingly the case for early termination of bed rest. From Newburger's review one definitely gets the impression that early ambulation has many advantages, without real disadvantages, and one wonders why the idea failed to gain general acceptance. Perhaps the failure was due to a lack of confidence in the security of catgut sutures, with which most wounds were closed. Experimental observations have been meager indeed, but Newberger himself[9] carried out a study on the tensile strength of healing wounds in rats, and was able to show that immobilized animals showed a distinct difference as compared with those which are exercised. While the tensile strength in the two groups was the same on the third and on the tenth day, the exercised animals showed a definitely greater tensile strength on the fifth day.

"The Abuse of Rest in the Treatment of Disease" was the subject of a symposium held in 1944 at a meeting of the American Medical Association. Medical, surgical and other types of disease were discussed.[10] A paper by Powers[11] presented detailed data in regard to the effect of early ambulation after a variety of abdominal operations as compared with the results in control cases treated by traditional methods. The evidence was clearly in favor of early ambulation.

Two other communications on the early termination of postoperative bed rest have appeared in the past few years. Leithauser[12] in 1943 stated that as a result of his experience he was very much in favor of early ambulation. He included observations on the vital capacity of 21 of his patients, of whom 13 had had appendicectomies and 8 cholecystectomies. He reported a return to a normal vital capacity much more rapidly than that reported by others in patients treated with the usual period of bed rest. Nelson,[13] after personal observation of over 400 patients, also was greatly impressed with the value of early postoperative ambulation. Only 3 patients had partial wound disruption and in only 2 did small incisional hernias develop. In World War II a number of studies were made on the beneficial effect of early ambulation after abdominal operation and after head injuries in military personnel. A witty and provocative editorial in a recent number of the *Lancet*, entitled "Keep Moving Please,"[14] summarized the current English reaction to early ambulation after operation.

Among the evil sequelae of complete bed rest, interestingly discussed by Dock,[15] are circulatory changes associated with thromboses and emboli. There is, of course, a large literature on the etiology of postoperative thrombosis and embolism. The influence of bed rest and immobility was convincingly

6. Cole, W. H., and Elman, R.: Textbook of General Surgery, ed. 4, New York, D. Appleton-Century Co., 1944, p. 173.
7. Newburger, B.: Surgery 14:142, 1943.
8. Claremont, H. E.: Lancet 1:427, 1922. Rowlands, R. P., ibid. 1:52, 1922.
9. Newburger, B.: Surgery 13:692, 1943.
10. Symposium on the Abuse of Rest in the Treatment of Disease, J. A. M. A. 125:1075, 1944.
11. Powers, J. H.: J. A. M. A. 125:1079, 1944.
12. Leithauser, D. J.: Arch. Surg. 47:203, 1943.
13. Nelson, H.: Arch. Surg. 49:1, 1944.
14. Editorial, "Keep Moving Please," Lancet 1:118, 1945.
15. Dock, W.: J. A. M. A. 125:1083, 1944.

shown in a recent study by Hunter, Krygier, Kennedy and Sneeden.[16] They dissected the leg veins in 169 subjects at autopsy to demonstrate the presence or absence of thrombosis. All the subjects had been in the hospital for forty-eight hours or more before death. They were grouped as (1) those who exercised in bed and were ambulatory up to forty-eight hours before death and (2) those who did not exercise and were nonambulatory. In the first, or ambulatory, group, only 5 medical and 2 surgical subjects showed thrombosis, an incidence of 17.9 per cent; in the second, or nonambulatory group, 42 medical and 27 surgical subjects showed thrombosis, an incidence of 53.1 per cent. In a discussion of the literature on the etiology of thrombosis, these authors emphasized confinement in bed as the common denominator of all studies.

Other effects of bed rest could be discussed. Fairly well known are all the changes associated with the atrophy of disuse. These occur to a lesser or greater degree according to the degree and duration of immobility. Then there are metabolic changes, alterations in cardiovascular mechanisms, loss of neuromuscular skill, etc. Many of these changes were discussed in a "Symposium on Physiological Aspects of Convalescence and Rehabilitation" published by the American Physiological Society.[17]

It is obvious from this brief résumé of the literature that bed rest and immobilization cannot be viewed with complacency. Their effects must be looked on objectively and their disadvantages weighed impartially against their advantages, with accurate attention to detail in terms of the actual results achieved. Bed rest and immobilization have well known and definite beneficial effects which must be utilized so far as possible without producing deleterious results. To do so completely, probably is impossible.

The elusive quality of judgment is necessary in deciding just when to terminate bed rest. Certainly bed rest should be utilized only as long as it achieves beneficial results. It should be terminated at the point at which the advantages of mobilization begin to outweigh the disadvantages of immobilization.

From the studies reported, it would seem that early ambulation has the following advantages: a lowered incidence of postoperative, particularly pulmonary and vascular, complications; less nausea, vomiting and abdominal distention; an earlier return of normal functions of the bladder and the bowel; a beneficial psychologic effect on the patient's morale and mental status, and an acceleration of convalescence permitting an earlier return to work and resultant economic saving to the patient.

Clinical Procedure and Findings

In a study on surgical convalescence,[18] physical medicine was utilized as an essential part of the program, although nutritional therapy and psychotherapy were probably of equal importance. The procedures to be followed were carefully explained to the patient before operation, a detail the importance of which cannot be emphasized too greatly. The explanation to the patient of the program of exercise and early ambulation in itself seemed to have a beneficial therapeutic effect. It seemed to us that in the past the average patient was permitted to suffer complete ignorance as to the nature of the operation to be performed on him and what he could expect afterward. This policy of silence or even mystery was obviously inadvertent, but seemed nevertheless deeply ingrained in the tradition of surgical care. For this

16. Hunter, W. C.: Krygier, J. J.; Kennedy, J. C., and Sneeden, V. D.: Surgery 17:178, 1945.
17. Symposium on Physiological Aspects of Convalescence and Rehabilitation, Federation Proc. 3: 188, 1944.
18. Elman, R., and Akin, John T., Jr.: Ann. Surg. 122:716, 1945.

reason the therapeutic plans were discussed frankly and individually with each patient.

A second general observation we made was the fact that physical procedures were carried out much more efficiently in a large ward, where each patient could see for himself the effects of the program on patients operated on previously. This influence of example was repeatedly observed and is similar to that noted by many workers in the field of physical medicine. Patients in single rooms did not have such an example, and as a result ambulation started somewhat later.

As soon as the patient awakened from the anesthetic he was started on breathing exercises, taken every hour for about five or ten minutes and consisting of deep inspiration and expiration. The one deterrent was the presence of pain, and this was controlled by appropriate sedatives when severe. Pulmonary complications often started as patchy areas of atelectasis or accumulations of fluid or mucus in the small bronchioles. When these were present the patient was allowed to sit up in bed and with firm support applied to the abdomen and lower costal margin was urged to cough forcibly in order to expectorate accumulated secretions. This procedure also served to inflate unaereated parts of the lungs. It frequently was followed by dramatic improvement in breathing ability as well as in the general condition, particularly in surgical patients in the older age group.

Calisthentic exercises of the upper and lower extremities were started almost immediately after operation. It was necessary, however, to outline a definite porgram lest the indifference of the patient or the shortage of nursing personnel result in no movement at all. Here the influence of example by other patients made itself felt. The head rest was elevated as soon as the patient was conscious, and almost immediately the patient was allowed to sit on the edge of the bed with the feet dangling or resting on a chair. This position in itself is known to improve vital capacity and seemed to have a beneficial psychologic effect. The upright position usually made micturition easier.

Early ambulation was left to the wishes of the patient. Each day the question of walking was discussed and the patient reassured in regard to the danger of wound disruption, the fear of which seemed to be the greatest deterrent in the minds of most patients. The greatest stimulus to early ambulation was the observation of other patients getting out of bed within a day or two after operation.

In the series of 79 cases observed, no wound disruptions occurred and there were no pulmonary accidents. In control cases treated in the same wards in alternate periods, 2 wound disruptions were observed, both of which required resuture; 3 pulmonary accidents occurred, 2 of which resulted in immediate death.

The most important effect of the use of physical medicine (in addition to nutritional therapy and psychotherapy) during convalescence was the almost complete rehabilitation of the patient at the time of discharge, which in this series of cases was purposely made to occur after a period of the same length as in the control group. This complete restoration was evident not only in the subjective feelings of the patient but in a few objective findings. The latter included the relative absence of loss of weight, which averaged 1 pound, as well as an increase rather than a decrease in the level of serum albumin, as compared with findings in control cases. However, beneficial effects were evident even before the patient was discharged. In fact, many patients stated that they felt strong enough to leave the hospital and go home even before their stitches were removed. Some of them objected to

our requirement that they remain the usual fortnight. This was in striking contrast to the obviously asthenic condition of the control patients, who had been kept immobile in bed for ten days and were often permitted to go home the next day to two thereafter.

Summary

The beneficial effects of physical medicine during surgical convalescence was exemplified in a series of 79 cases in which early pulmonary and general muscular exercises were started immediately after operation and in which early ambulation was carried out. Complete rehabilitation had been achieved at the time of discharge, even though many of the operations consisted of extensive resections of the stomach and intestines. These beneficial effects were in striking contrast to the asthenic condition in the control group, in which the customary routine of complete immobilization was carried out.

Note: This manuscript was prepared on request and in part is reprinted from a paper [18] originally published in the Annals of Surgery, from whom permission for reproduction was obtained.

THE EXPANDING FIELD OF PHYSICAL MEDICINE *

FRANK H. KRUSEN, M.D.

Section on Physical Medicine, Mayo Clinic

ROCHESTER, MINN.

It is becoming more and more apparent that physical medicine is expanding rapidly and that in the future, it will encompass a broad and at present considerably neglected phase of medical practice. As defined recently by the Council on Physical Medicine of the American Medical Association, physical medicine includes the employment of the physical and other effective properties of light, heat, cold, water, electricity, massage, manipulation, exercise and mechanical devices for physical and occupational therapy in the diagnosis and treatment of disease. In one sense physical medicine is really applied biophysics.

As it is now developing, physical medicine is progressing into three major fields: (1) physical therapy and the employment of physical agents in diagnosis, (2) occupational therapy and (3) reconditioning of the convalescent patient. Physical agents are employed not only in therapy but also in diagnosis so that there are interesting developments not alone in the definitive treatment of disease by physical agents but also in the employment of physical procedures as an aid in diagnosis.

Occupational therapy is expanding rapidly and seems to be breaking away from its preoccupation with arts and crafts and to be extending into a wider field including new prevocational, avocational and vocational pursuits. Finally, owing to the influences brought to bear by the various military convalescent and reconditioning programs, there has been developed in the past two years an important new phase of physical medicine, the physical reconditioning of the convalescent patient which includes not only physical train-

* Reprinted with permission from Proceedings of the Staff Meetings of the Mayo Clinic 20: 497 (Dec. 26) 1945.

ing but also the provision of educational and recreational programs for the convalescent patient.

During the past year, several of the leading medical schools in this country have turned their attention to the development of adequate programs for research in the fundamental aspects of physical medicine. This is perhaps the most promising of all the forward steps in this growing field of medical practice.

Dr. Alan Gregg,[1] medical director of the Rockefeller Foundation, said recently: "Among my major hopes, let me record the wish that biophysics may be soon recognized as the brother of biochemistry, even if the time is now too late to consider it a twin . . . One of the natural outgrowths of such a preclinical science might be the now long overdue development of physical therapy in this country."

Since physical agents are employed both in diagnosis and therapy, the term "physical medicine," long in use in England, is gradually replacing the designation "physical therapy" in this country. Physical medicine is the more generic and more inclusive term and, as recently defined by the Council on Physical Medicine, it embraces physical therapy, occupational therapy and the employment of physical agents for diagnostic purposes. It also includes the rapidly developing field of reconditioning of the convalescent patient.

Physical medicine has now developed to a point at which it must be considered as a separate and distinct medical specialty. The recent tremendous interest in this special branch of medicine, culminating in the activities of the Baruch Committee, indicates that physical medicine has at last come of age.

Dr. Frank Ober, professor of orthopedics and assistant dean of Harvard Medical School, told me recently: "The last war established orthopedic surgery as a recognized specialty. This war may well do the same for physical medicine."

Last year the famed elder statesman and humanitarian, Mr. Bernard M. Baruch, impressed with the possibilities of physical medicine by his father, the late Dr. Simon Baruch, appointed a committee headed by Dr. Ray Lyman Wilbur to make a survey and to report on the programs deemed best for adequate development of physical medicine in the United States. Eight subcommittees, composed of a total of forty scientists, were appointed to make this survey and these subcommittees in turn consulted directly more than 400 other outstanding scientists concerning the various phases of their problem.

The committee decided that the chief needs for proper development of physical medicine are three: (1) an adequate supply of physicians who can teach and use physical medicine; (2) more extensive basic and clinical research in physical medicine and (3) proper use of physical medicine in relation to wartime rehabilitation and peacetime physical preparedness.

On completion of its survey in April, 1944, the committee published a full report of its findings and Mr. Baruch gave the initial sum of $1,100,000 to activate the program which was recommended. A permanent organization was established to carry the plan to completion. A central office with an administrative board has been established; a scientific advisory committee has been functioning for the past year. Also, a Committee on War and Postwar Physical Rehabilitation and Reconditioning has been organized and recently held its fifth bimonthly meeting in Washington.

1. Gregg, Alan: Quoted by Krusen, F. H.: The Future of Physical Medicine With Special Reference to the Recommendations of the Baruch Committee on Physical Medicine, J. A. M. A. 125:1093 (Aug. 19) 1944.

Columbia University College of Physicians and Surgeons was given the sum of $400,000 to establish a model center for basic research and teaching of physical medicine. Additional teaching and research centers have been established at Harvard Medical School which has been given $30,000 to provide fellowships in physical medicine, the University of Minnesota Medical School which has been given $40,000 to promote teaching in physical medicine, the Massachusetts Institute of Technology which has been given $50,000 to establish an important center on biophysics, electronics and instrumentation as related to medicine and the University of Southern California which has been given $30,000 to inaugurate a program of teaching and research. The Medical College of Virginia was given $250,000 to establish a center for research and teaching in physical medicine as related to hydrology and the New York University College of Medicine was given $250,000 to establish a center for teaching and research in physical medicine with special reference to problems of structural mechanics. The sum of $100,000 was set aside for fellowships in physical medicine and another $100,000 for promotion of minor projects in research and teaching as related to physical medicine. Minor grants for research or teaching have been given to such medical schools as the University of Illinois College of Medicine, the State University of Iowa College of Medicine and Marquette University School of Medicine.

So it can be seen that this project is well launched and gives great promise of finally establishing physical medicine on a sound and lasting scientific basis. Even more encouraging is the fact that the Baruch Committee has not been alone in the support of adequate research as related to physical medicine. During the past year, the National Foundation for Infantile Paralysis has made large grants for establishment of teaching and research centers in physical medicine at the University of Pennsylvania School of Medicine, at Northwestern University Medical School, at Stanford University School of Medicine and at the University of Minnesota Medical School. To those who are associated with the University of Minnesota, it is pleasing to find that their institution is participating so actively in the expanding program for the development of physical medicine.

In attempting to determine how best to provide some inkling of what seems to lie ahead for physical medicine, I have decided that it would be well to consider two phases of the program which, while by no means presenting the whole picture, may give some idea of the progress which can be expected. Because I have been serving as the director of the Baruch Committee since its survey began, I have had the opportunity to study some of the recent developments in biophysics as related to medicine and some of the advances in physical rehabilitation of the disabled as practiced in military hospitals. It is these two subjects, biophysics and rehabilitation, therefore, which I should like to present in the hope of giving a glimpse into the future of physical medicine.

The Future of Electronics and Electrical Instrumentation as Related to Medicine

During the course of the survey, I had the privilege of visiting certain academic and commercial research laboratories, including the Department of Biological Engineering at Massachusetts Institute of Technology. What I saw opened my eyes with regard to the possibilities of electrophysics as related to medicine in the postwar world.

At one research center, I saw a new 100,000,000 volt electron accelerator. This device provides high velocity electrons corresponding to voltages all the way from 2,000,000 to 100,000,000 volts. For comparison, radium radiations correspond to about 2,000,000 volts. This new device provides radia-

tion right up to the edge of the cosmic rays and will open up a whole new field for investigation in the realm of physical medicine.

I learned of new electronic tubes which provide microwaves which can be projected along a beam. It is now possible to provide 10 kilowatts of high frequency power in wavelengths as short as 50 cm. or less. With these new electronic tubes which can be obtained after the war, it will be possible to direct a beam of high frequency energy toward a certain region of the body. It may perhaps even be possible to cross-fire two or more such beams to obtain proper localization of heat in a bodily region. It will be possible to focus such a beam accurately and for example, at a wavelength of 20 cm., the beam would focus on a spot 5 cm. in diameter. In other words, the circumference of the beam would be a quarter of the wavelength.

A study of the effect of microwaves, as produced by these newer types of electronic tubes, in heating of human tissues, will certainly be a fertile field of investigation.

I talked with the famed physicist and winner of the Nobel Prize, Dr. Irving Langmuir, about his studies on surface phenomena and solutions of protein. These studies will have many biologic applications. Single layers of molecules can be seen and detected. One can detect extremely small amounts of substances in solution. Studies on the roentgenologic patterns of proteins promise to give eventually the true structure of the protein molecule. Dr. Langmuir expressed the belief that although much more work is needed, it is merely a question of time before the problem is unraveled.

Once the true structure of the protein molecule is determined, the chemistry of protein will be revolutionized. With proper study, this information should come within ten years. Investigations along this line should be part of some basic medical research project. A whole world of chemistry of megamolecules will open. Langmuir expressed the opinion that eventually there will be a need for an institute of megamolecules. Roentgen-ray and electron diffraction will be employed chiefly at such an institute.

I found that it will be possible to make binaural hearing aids for the deaf so that they can tell from which direction sounds are coming. With the currently employed monaural hearing aid, the deaf are unable to determine from which direction sounds emanate. Moreover, such binaural hearing aids would cut down reverberation which is even more important than correction of directional defects.

I was told by Dr. Olson, an expert on acoustics, that it would be possible to make a hearing aid which could be operated from the ordinary alternating current in a household light socket. Such a device would be far superior to the small portable hearing aids now on the market. A person working for many hours at a desk might well appreciate having such a better quality hearing aid which he could connect to a wire whenever he chose to do so. This could supplement his portable device.

I saw a photo-electric recorder which can measure accurately periods of time from one ten-thousandth of a second up to three seconds. This can be used medically to study reaction times.

I saw a photo-electric spectrophotometer which measures reflectance transmission against wavelength in millimicrons and records accurately on paper the curves produced by various colors. This can be employed medically in the laboratory for study and solution of nearly all color problems and in making accurate color matching tests.

I saw a new integrating exposure meter which measures time against intensity of radiation. This device can be employed in connection with radiation therapy to make dosage much more accurate.

I saw new types of cathode-ray oscillographs which are extremely useful in electromedical research for studying the characteristics of electrical circuits.

I saw experimental models of electron microscopes which had been so modified in size and construction that it was predicted that eventually electron microscopes will cost less than $5,000 and will come in table models or will go into a suitcase.

I talked with Dr. Hillyer who developed the electron microscope at the University of Toronto. He showed me a table model of the electron microscope which would provide 5,000 magnifications within the instrument of such accuracy that one can then obtain fifteen to twenty times more magnification photographically so that one can still get a clear picture of an object which has been magnified 75,000 to 100,000 times. The medical possibilities are almost beyond imagination.

Dr. Hillyer showed me his electron analyzer, an electron microscope in conjunction with which a small beam of electrons, which he calls an electron probe, can be directed to small regions of the field being examined. The degree of penetration of a substance in the field determines its composition. Thus one can analyze extremely small microscopic substances. He mentioned jokingly that with this electron probe, it would be perfectly possible for one to write his signature on a bacterium. The circumference of the beam of the probe is only about 20 Angström units. This analyzer will open other vast fields of medical physics.

I found that radio engineers believe that direct current amplifiers for measurement of nerve impulses are antiquated. Efficient high voltage amplifiers should be developed.

Dr. Brown, expert on high frequency currents, told me that there were great possibilities for quick sterilization of surgical instruments by means of high frequency coils. Short periods of exposure to intense "shots" of power could be utilized. The method has already been utilized for quick sterilization of drinking glasses. Intense sterilizing heat can be applied in a second or less. In "flash pasteurization" of milk, it can be heated by the high frequency current to a temperature of 190° F. in four-fifths of a second.

We may conclude then, I think, with Mr. Engstrom, a leading radio engineer, that what is needed is for physicians to consider the physical tools which have already been developed. He said: "The main thing lacking is proper liaison between radio engineers and physicians." Physicians who are interested in research in physical medicine should become familiar with the field of modern electrical physics and then pick out the tools in the electrical research laboratory which would be of value in therapy and in medical research.

I am happy to announce that the Mayo Foundation and the Department of Biologic Engineering at Massachusetts Institute of Technology have developed a plan which will permit certain of the better qualified young physicians who are taking the regular fellowship in physical medicine to spend a quarter of a year at the Massachusetts Institute of Technology, studying biophysics, electronics and instrumentation as related to medicine. I believe that this is a distinct step forward and that it will be of aid in utilizing more fully the amazing new physical instruments which will soon be available for research, for medical diagnosis and for therapy.

The Future of Physical Rehabilitation of the Disabled

Rehabilitation has been defined as the restoration of the handicapped to the fullest physical, mental, social, vocational and economic usefulness of which they are capable. The Baruch Subcommittee on Rehabilitation

pointed out that rehabilitation fills the gap between the customary end point of medical attention and the real necessities of many patients. One of the consultants to the Baruch Committee, an experienced physician who has become profoundly impressed with the broad purposes of the rehabilitation program, has suggested in the following quotation a new and enlarged conception of physical medicine. He wrote: "It seems that there are two definite phases: first, physical medicine as it pertains to definitive treatment and how it can be utilized by the physician in the diagnosis and treatment of disease; secondly—and which I think is the more or less new concept as far as the general medical profession is concerned—its utilization in the broad field, taking up the dead space between definite care and ability to return to productive work, the setup for retraining and reconditioning, medicine and its relation to environment, occupation, social status, etc. It is going to take physicians with real training and background to meet this special need; it should be the broadest of all medical specialties, utilizing as a basis for physical medicine the great potentialities of oneself. This would be more or less the science of how to use these potentialities and the art of such application." [2]

As I have presided at the meetings of the Baruch Committee on War and Postwar Physical Rehabilitation and Reconditioning which consists of the heads of physical rehabilitation programs in the Army, the Navy, the Air Forces, the Veterans Administration, the Federal Security Agency, the Marine hospitals and the National Research Council, I have been utterly amazed as I have watched a whole new field of medical endeavor unfolding before my eyes so that now reconditioning of the disabled has become an integral part of the medical programs of practically all of the army and navy hospitals.

Physical therapy, occupational therapy, physical training and educational and recreational programs are being beautifully coordinated in a manner which is completely revolutionizing the convalescent routines for the sick and disabled.

Dr. George Deaver[3] at the Institute for the Crippled and Disabled in New York has been developing new patterns for the training of the seriously disabled to meet the physical demands of daily life. This center has trained and is still training many army officers and physicians of the Veterans Administration in the rehabilitation of the seriously disabled. After careful study, Deaver has discovered that each seriously disabled person must strive to achieve thirty-seven different skills in order that he may become independent and self-reliant. These include such simple tasks as opening and closing a door, walking unaided, learning to cross a city street from curb to curb during the time when a green light is on, learning to climb bus steps and to hold on to an overhead strap in bus or trolley car, learning to dress and undress, to care for one's toilet, to sit in and rise from a chair, to feed oneself, to use a telephone, to open and seal letters and to write.

Educational and recreational activities which would improve morale and general physical well-being are now being provided in army and navy hospitals in ever increasing amounts.

There is now no room for doubt that the astounding developments in the physical rehabilitation and reconditioning of wounded soldiers and sailors, as it is being perfected in military hospitals, will tend to revolutionize physical medicine as practiced in civilian hospitals. Just as young medical officers

2. War and Postwar Rehabilitation and Reconditioning: a Bulletin of Information, New York, Baruch Committee on Physical Medicine, (Dec.) 1944, 28 pp.

3. Deaver, G. G., and Brown, Mary E.: Physical Demands of Daily Life: an Objective Scale for Rating the Orthopedically Exceptional. In: Studies of Rehabilitation, (Pamphlet), New York, Institute for the Crippled and Disabled, 1945, p. 3.

in the army trained in physical medicine, are being assigned as chiefs of the reconditioning division or physical medicine of each army general hospital, so will there be a need for physicians trained in physical medicine to head similar reconditioning programs in civilian hospitals. Major Henry B. Gwynn[4] of the Reconditioning Consultants' Division of the Office of the Surgeon General has stressed this point. Recently he wrote: "No more will we hear patients told: 'Your stitches are out now, you can go home tomorrow or the day after. When you get home, take it easy for a while, and when you feel strong enough, go back to work.'"

In the future, physicians will have to give more attention to each scientific detail of a suitable convalescent regimen which will fill the gap previously mentioned between the usual end point of medical care and the real necessities of most patients. Gwynn foresees the establishment of elaborate physical reconditioning programs in all of our civilian hospitals following the war. He mentioned that: "Too often physical medicine is looked upon as merely an orthopedic therapy aid and its role in other surgical, medical and mental conditions completely overlooked." It seems apparent from Gwynn's observations that public opinion, influenced by the results being obtained in the reconditioning programs in our military hospitals, will force the development of similar projects in civilian hospitals. Gwynn is wise enough to add the following statement: "However, to be successful such a program must also have the enthusiastic support of the medical profession. This will only be obtained when sufficient scientific data are assembled to change ideas which have been in vogue for several hundred years." He said that these data are now accumulating and will gradually be introduced into the curricula of medical schools.

I foresee then, and I hope that other physicians will envision with me, the possibility of a tremendous expansion of physical medicine in the realm of the physical rehabilitation of the sick, wounded and disabled in civilian hospitals. I hope physicians will agree with me that the prospects for rapid expansion of that special branch of medical practice known as physical medicine appear very promising.

Comment

Not only the science but the art of physical medicine is developing rapidly and along sound lines. Adequate scientific development is assured by the establishment of the numerous new research centers in many of the larger and finer university medical schools. Proper development of the art of physical medicine is being obtained by the tremendous experience being gained in physical therapy, occupational therapy, physical reconditioning, educational and recreational therapy in government hospitals.

Indeed the future of physical medicine looks exceedingly bright.

4. Gwynn, H. B.: Reconditioning in Civilian Hospitals, Unpublished data.

STUDIES ON NEUROMUSCULAR DYSFUNCTION *

V. Neostigmine Therapy of Acute and Chronic Backache

HERMAN KABAT, M.D., Ph.D.
Senior Assistant Sanitarian (R)
and
CHARLES W. JONES, M.D.
Senior Assistant Surgeon (R)
United States Public Health Service
WASHINGTON, D. C.

Neostigmine has an established place in the therapy of myasthenia gravis.[1] In this disease there appears to be a defect in conduction at the myoneural junction which can be corrected by neostigmine.[2] The fatigue and weakness of the disease are overcome by the drug apparently through action on cholinesterase at the myoneural junction, with resulting facilitation of the passage of excitation to the skeletal muscle.

An inhibitory action of neostigmine on the motor system may occur in two ways:

1. Neostigmine acts at the myoneural junction in small doses as a stimulating agent, but in larger doses in normal persons it acts to inhibit transmission at the myoneural junction.[3]

2. By action directly on the spinal cord neostigmine depresses deep reflexes and muscle tonus both in animals[4] and in man.[5]

The first therapeutic application of the inhibitory action of neostigmine on the neuromuscular system was reported by Kabat and Knapp in 1943.[6] These workers demonstrated that neostigmine decreases muscle spasm (hypertonus and proprioceptive reflex hyperirritability) and incoordination in poliomyelitis. They showed that the drug could accelerate recovery in subacute and chronic cases, that its effects were not nullified by atropine and that the improvement was usually retained after therapy is discontinued. These observations have since been confirmed.[7]

Kabat and Knapp[6] also studied the mechanism of the inhibitory action of neostigmine. They observed an inhibitory effect on muscle spasm from intrathecal administration; they showed that the effect was not blocked by atropine and that decrease in incoordination and reflex hyperirritability could not be explained by action of the drug at the myoneural junction. They therefore suggested that the inhibitory action on muscle spasm and incoordination in poliomyelitis could best be explained as an action of the drug

* From the Hospital Division and the Division of Public Health Methods.
Assistant Surgeon General R. C. Williams, Medical Director W. F. Ossenfort, the late medical director, W. S. Bean, and Mr. G. St. J. Perrott made this investigation possible.

1. Viets, H. R.; Mitchell, R. S., and Schwab, R. S.: Oral Administration of Prostigmine in the Treatment of Myasthenia Gravis, J. A. M. A. 109:1956, 1937.
2. Harvey, A. M., and Lilienthal, J. L., Jr.: Observations on the Nature of Myasthenia Gravis; Intra-Arterial Injection of Acetylcholine, Prostigmine and Adrenaline, Bull. Johns Hopkins Hosp. 69: 566, 1941.
3. Harvey, A. M.; Lilienthal, J. L., Jr., and Talbot, S. A.: On the Effects of Intra-Arterial Injection of Acetylcholine and Prostigmine in Normal Man, Bull. Johns Hopkins Hosp. 69:529, 1941.
4. Schweitzer, A., and Wright, S.: Action of Eserine and Related Compounds and of Acetylcholine on the Central Nervous System, J. Physiol, 89:165, 1937.
5. Kremer, M.: Action of Intrathecally Injected Prostigmine, Acetylcholine and Eserine on the Central Nervous System in Man, Quart. J. Exper. Physiol. 31:337, 1942.
6. Kabat, H., and Knapp, M. E.: The Use of Prostigmine in the Treatment of Poliomyelitis, J. A. M. A. 122:989, 1943.
7. Boines, G. J.: The Use of Prostigmine and a Modified Kenny Technic in the Treatment of Poliomyelitis, J. Pediat. 25:414, 1944. Eveleth, M. S., and Ryan, A. J.: Prostigmine in Acute Anterior Poliomyelitis, Yale J. Biol. & Med. 17:351, 1944.

at synapses in the spinal cord. More recent observations of Kabat[8] on the effect of neostigmine in hemiplegia provide additional evidence that the drug acts centrally at synapses, since relaxation of old contracture and increase in voluntary power have occurred during neostigmine therapy in the same muscle at the same time; this can best be understood by assuming a central action of the drug.

Evidence is accumulating that the therapeutic efficacy of neostigmine in decreasing muscle spasm is not restricted to poliomyelitis. The drug has been found to have significant therapeutic value, as a result of relaxation of muscle spasm, in chronic rheumatoid arthritis,[9] after fractures and other injuries,[8] in hemiplegia,[8] in spastic cerebral palsy,[10] in subacromial bursitis[8] and in cervical intramuscular fibrositis.[11] In many of these conditions, in addition to relaxation of muscle spasm or contracture, rapid increase in strength, decrease in fatigue, improvement in coordination and relief from pain have been observed.

The present report is the result of an investigation of the therapeutic effect of neostigmine on acute and chronic backache. Backache may result from a wide variety of causes, and the mechanisms are complex and frequently obscure and controversial.[12] However, muscle spasm is in many instances a major factor in the disability and may persist long after its possible usefulness as a splinting mechanism has been exhausted. The observations presented hereafter indicate that neostigmine may be effective in the relaxation of muscle spasm in patients with low back pain.

Forty-seven patients with backache were treated for a brief period with neostigmine. Most of them were referred for therapy by staff members of the United States Marine Hospitals at Baltimore, Md.; Hudson Street, New York; Norfolk, Va., and Stapleton, S. I., New York, and at the United States Public Health Service Dispensary, Washington, D. C. Patients were selected for study if muscle spasm and muscular pain appeared to play a prominent role in the disability, if there was no obvious evidence of a psychogenic origin of the symptoms and if the disability had not improved significantly with other forms of treatment. Most of the patients were treated as outpatients, and many continued to work while receiving therapy.

After a patient was selected for study all other types of therapy were discontinued. In some of the chronic cases saline solution was administered intramuscularly as a placebo for one week, after which daily intramuscular injections of neostigmine methylsulfate, 2 cc. of 1:2,000 solution (1 mg.), together with atropine sulfate 1/150 grain (0.43 mg.), were administered for two weeks. Some patients were more sensitive to the drug and were given 1 cc. of neostigmine methylsulfate, 1:2,000 solution, with atropine sulfate 1/200 grain. Other patients were able to take 3 cc. of neostigmine methylsulfate, 1:2,000 solution, with atropine sulfate 1/100 grain, without showing toxic effects. Some of the patients were given neostigmine by mouth in a

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8. Kabat, H.: Studies on Neuromuscular Dysfunction: I. Neostigmine Therapy of Neuromuscular Dysfunction Resulting From Trauma; II, Neostigmine Therapy of Hemiplegia, Facial Paralysis and Cerebral Palsy; III. Neostigmine Therapy of Chronic Rheumatoid Arthritis and Subacromal Bursitis, Pub. Health Rep. 59:1635, 1944.

9. Trommer, P. R., and Cohen, A.: The Use of Neostigmine in the Treatment of Muscle Spasm in Rheumatoid Arthritis and Associated Conditions: Preliminary Report, J. A. M. A. 124:1237, 1944. Kabat.8

10. Schaubel, H. J.: Prostigmine as an Adjunct in the Treatment of Spastic Cerebral Palsy, Physiotherapy Rev. 24:236, 1944. Kabat.8

11. Kabat, H., and Jones, C. W.: Studies on Neuromuscular Dysfunction: IV. Neostigmine Therapy of Acute and Chronic Cervical Intramuscular Fibrositis. Arch. Phys. Med. 26:691 (Nov.) 1945.

12. Lewin, P.: Backache and Sciatic Neuritis, Philadelphia, Lea & Febiger, 1943.

dose of 15 to 45 mg. three times a day together with sufficient atropine to counteract unpleasant side effects.

Atropine was used routinely with neostigmine to eliminate the unpleasant parasympathetic side effects. Since the inhibitory effect of neostigmine on muscle spasm is presumably central and since atropine does not interfere with the action of neostigmine on the central nervous system, the efficacy of the treatment is probably not reduced by the addition of atropine. The dose of neostigmine and atropine should be adjusted to the individual patient on the basis of the systemic effects observed.

A word of caution with regard to large doses of neostigmine, as reported in this study, is in order. While only insignificant and minor reactions were observed in most patients, and the patients frequently continued their daily occupation, neostigmine is a powerful drug and the physician must keep a close watch for symptoms of toxicity.[13] A few patients are sensitive to small doses, while others take large amounts without showing any toxic reactions. A safe procedure is to start with a small test dose of neostigmine and atropine and build up and adjust the dose according to the tolerance shown. Patients given neostigmine and atropine must be seen frequently so that toxic reactions may be avoided. Viets, who has had extensive experience with neostigmine in the treatment of myasthenia gravis, stated recently that no patient is known to have died from neostigmine.[14]

Examinations were conducted as a rule once a week, and records were kept of subjective findings, tenderness, muscle spasm and the status of the deep reflexes. Careful measurements were made of range of passive and active motion of the spine and lower extremities, and weekly muscle tests for strength were carried out. Since a majority of the patients suffered from a chronic disability which had failed to improve with other types of treatment, it was possible to evaluate the therapeutic effects of neostigmine with considerable assurance.

Results

A. *Chronic Backache.* — Neostigmine[15] therapy was tried in 24 cases of subacute and chronic back pain. The duration of the disability varied from one month to twenty years. Other methods of treatment had been applied previously without relieving the condition. Eight of the patients were given injections of saline solution daily for one week as a placebo without showing improvement. In 15 of the 24 cases, or 62 per cent, significant improvement was observed in the course of several weeks of daily injections of neostigmine and atropine. In the other 9 cases improvement was either slight or absent. The improvement was, as a rule, retained after therapy was discontinued. The data are tabulated in the accompanying table.

Several illustrative cases are reported hereafter. Cases 2, 7 and 13 are representative of those in which marked improvement (+++) followed neostigmine therapy.

CASE 2. — B., a woman aged 45, complained of continuous pain and aching in the back which had been present for six years and of frequent attacks of backache in the preceding twelve years. The trouble with her back originated with a lumbosacral strain eighteen years earlier. The constant backache had followed influenza. She had aching, muscle spasm and tenderness in the neck and scapular regions as well as in the lumbar

13. Goodman, L. S., and Gilman, A.: The Pharmacological Basis of Therapeutics, New York, the Macmillan Co., 1941.
14. Viets, H. R.: Myasthenia Gravis Treated with Large Doses of Neostigmine Methylsulfate, Intramuscularly and Intravenously and with Neostigmine Bromide Orally, Am. J. M. Sc. 208:701, 1944.
15. The neostigmine was furnished by Hoffmann-La Roche, Inc., Nutley, N. J.

Neostigmine Therapy of Chronic Backache

Case No.	Age	Sex	Diagnosis	Duration	Saline Control	Period of Neostigmine	Improvement on Neostigmine*	Follow-Up and Comment
1	55	F	Chronic lumbar intramuscular fibrositis; rheumatoid arthritis	20 yr.		3 wk.	+++	Complete relief; no recurrence for 2 mo.
2	45	F	Chronic backache; postural strain	18 yr.		3 wk.	+++	Complete relief; no recurrence in 1½ mo.
3	45	F	Chronic lumbosacral strain	5 yr.		6 wk.	+++	Marked improvement
4	43	M	Chronic intramuscular fibrositis	5 yr.		2 mo.	+	Definite increase in strength; only slight decrease in pain
5	22	M	Chronic intramuscular fibrositis	2 yr.		1 wk.	+++	Complete relief
6	27	F	Chronic lumbosacral strain	2 yr.		2 wk.	+++	Marked improvement
7	45	M	Chronic lumbosacral strain	1½ yr.		3 wk.	+++	Complete relief; no recurrence in 1 mo.
8	23	M	Chronic lumbosacral strain	1 yr.		1 wk.	0	No improvement
9	21	M	Chronic intramuscular fibrositis	1½ yr.	Yes	2 wk.	++	Significant increase in mobility and relief from pain
10	28	M	Chronic intramuscular fibrositis	1 yr.		10 days	++	Increase in range of motion; decrease in muscle spasm and pain
11	23	M	Chronic backache; postural strain	1 yr.	Yes	2 wk.	++	Decrease in pain and increase in strength and mobility
12	23	M	Chronic intramuscular fibrositis	5 mo.		1 wk.	+	Patient able to walk without cane; slight increase in mobility; no change in pain
13	48	F	Postural occupational strain	5 mo.		2 wk.	+++	Complete relief; no recurrence in 4 mo.
14	27	M	Postlaminectomy; wound infection	4 mo.	Yes	2 wk.	0	No improvement
15	42	M	Lumbosacral strain	4 mo.	Yes	2 wk.	+	Some decrease in pain
16	32	M	Lumbosacral strain	2 mo.	Yes	2 wk.	+++	Marked improvement; no recurrence in 2 wk.
17	27	M	Lumbosacral strain	2 mo.	Yes	2 wk.	+	Definite increase in strength; no change in back pain
18	39	M	Lumbosacral strain	6 wk.	Yes	2 wk.	+	Definite increase in mobility and decrease in pain
19	40	M	Intramuscular fibrositis	5 wk.		2 wk.	++	Marked decrease in pain and increase in mobility
20	25	M	Postlaminectomy	4 wk.		2 wk.	+++	Marked improvement
21	45	M	Lumbosacral strain	4 wk.		1 wk.	0	Improvement slight and equivocal
22	43	M	Lumbosacral strain	4 wk.		1 wk.	0	Toxic reaction to drugs
23	25	M	Intramuscular fibrositis	4 wk.	Yes	2 wk.	++	Marked relief from pain
24	50	M	Intramuscular fibrositis	4 wk.		2 wk.	+++	Marked improvement

* Three plus (+++) indicates marked improvement or complete relief (significant improvement); two plus (++), moderate improvement (significant improvement); one plus (+), slight improvement (definite but not significant), and 0, no improvement.

area. She never had sciatic pain. Examination revealed muscle spasm and tenderness of the erector spinae on the left side. A roentgenogram revealed slight right lateral scoliosis, and the left ilium was slightly elevated. Articular facets, especially on the concave side of the scoliosis, showed variations from the average which were apparently developmental in origin. The upper dorsal and lower lumbar vertebrae showed slight osteoarthritic changes. The disability had not been relieved by fracture boards, hot compresses, rest, exercises, and backlace support employed over a period of five years.

Neostigmine methylsulfate, 2 cc. of 1:2,000 solution (1 mg.), and atropine sulfate 1/150 grain were administered by intramuscular injection daily for three weeks. After one week of treatment the patient showed a striking improvement. The pain in the back was greatly decreased and no longer interfered with sleep. There was definite relaxation of the erector spinae muscles. After three weeks of neostigmine therapy the patient was completely free from pain, stiffness and muscle spasm. Removal of the fracture boards and strenuous exertion, such as moving furniture, failed to induce a backache. She was free from disability for one and one-half months after therapy was discontinued. Backache then recurred. The patient had been working longer hours than usual, had an upper respiratory tract infection and had begun to menstruate. Neostigmine was administered daily for one week; the symptoms subsided in a few days.

Case 7. — R., a man aged 45, engaged in unusual physical exertion for several days and noted soreness and aching in the muscles. He bent over for a short time to fix the license plate on his automobile and a severe low back pain developed. He was treated by bed rest, sedation and physical therapy for two months. Roentgenograms were negative. One and one-half years after the onset he was free from pain if he stood perfectly erect but had a sharp pain and muscle spasm in the erector spinae muscles if he bent forward even slightly. He suffered from low back pain when bending over a washbowl to wash his hands, etc. There was no pain or limitation of motion in sitting or in bending forward in bed. He had had the disability continuously since its onset, and no improvement was observed from various forms of therapy carried out for one year.

He was given injections of neostigmine methylsulfate, 3 cc. of 1:2,000 solution, together with atropine sulfate 1/150 grain, twice a week and took neostigmine bromide 45 mg. and atropine sulfate 1/150 grain orally three times a day. This treatment was continued for three weeks. After one week the patient was able to bend forward farther without inducing pain and the pain was less sharp. After three weeks there was complete relief of the disability; the patient was able without difficulty to touch his toes while bending from a standing position with knees straight, and he suffered no back pain at any time.

Case 13. — G., a woman aged 48, a dressmaker, had pain between the shoulder blades, in the lumbar region and in the deltoid region bilaterally. The pain was absent when she arose but became progressively more severe during the day, frequently necessitating her leaving work in the early afternoon. The pain was associated with muscle spasm and tenderness and was related to poor posture at her work. Physical therapy for several months failed to bring relief.

Five months after the onset, neostigmine methylsulfate, 2 cc. of 1:2,000 solution, and atropine sulfate 1/150 grain were administered once a week and she took neostigmine bromide 15 mg. three times a day for two weeks. There was complete relief at the end of one week of this therapy. Four months after treatment was discontinued there had been no recurrence although the patient continued the same occupation.

Cases 9 and 11 are representative of those in which moderate improvement (++), which is considered significant, followed neostigmine therapy.

Case 9. —A., a man aged 21, had had low back pain off and on for eighteen months. It had caused continuous disability for the past three months. There was no history of trauma. He had more back pain and stiffness on arising than later in the day, was worse in cold weather and was relieved by warm weather. There were muscle spasm and pain in the erector spinae muscles. He could bend forward to reach to 11 inches from the floor, complaining of a good deal of pain. Five days of daily injections of saline solution as a placebo caused no change in his condition. After two weeks of neostigmine and atropine injections there was a decided decrease in low back pain and the patient was able to bend forward to reach to 7 inches from the floor. He now had slight back pain only in the morning.

Case 11. — M., a man aged 23, had low back pain which developed after a hernia operation. There was no history of trauma. He had dull aching pain continuously, which was exaggerated by standing or walking. He had had the condition for one

year and had failed to respond to physical therapy. Examination revealed scoliosis of the lower thoracic part of the spine with concavity to the right and flattening of the gluteal fold on the right side. There was pain on hip flexion and extension on the right, and these motions could be carried out against only moderate resistance. The patient was able to bend forward and reach to 13 inches from the floor. Muscle spasm and pain were most marked in the right flank.

The patient was given daily injections of saline solution as a placebo for one week with no change in his condition. He was then given neostigmine methylsulfate, 2 cc. of 1:2,000 solution, and atropine sulfate 1/150 grain once daily for two weeks. At the end of this time he could bend forward to reach to 4 inches from the floor and had normal strength in hip flexion and extension on the right side, with much less pain from these motions. There was a decrease in muscle spasm in the back but the patient still complained of low back pain.

Case 17 is representative of those in which slight improvement (+), which is not considered significant, followed neostigmine therapy.

Case 17. — M., a man aged 27, fell down a ladder and incurred a lumbosacral strain. He had constant pain associated with spasm of the erector spinae muscles. He obtained some relief from strapping of the back. The disability had been present for two months and was not showing improvement. Knee flexion and extension could be carried out against only slight resistance. He was able to bend forward to reach to 20 inches from the floor. Daily injections of saline solution for one week resulted in no significant change. After two meeks of neostigmine therapy there was a definite increase in strength of knee flexion and extension and the patient could bend forward to reach to 14 inches from the floor. There was no significant change in the low back pain.

B. *Fracture of Lumbar Vertebrae.* — Eight patients with fractures of the lumbar vertebrae with periods of disability ranging from three months to several years were treated with injections of neostigmine and atropine. They all had serious disability which had not been responding to other forms of treatment. Five of the eight had significant relief from pain, increase in range of motion and increase in strength during neostigmine therapy, but none had complete relief.

Case 25. — D., a man aged 48, had a compression fracture of the third lumbar vertebra and fracture of the left transverse processes of the first, third, fourth and fifth lumbar vertebrae in January, 1944. One year later, in spite of orthopedic treatment from the onset and physical therapy, he had constant severe pain in the lumbar region and in the leg. The pain, which was not responding to treatment, was aggravated by prolonged standing or walking, and the patient walked with a limp.

In January, 1945 he was given daily injections of saline solution for one week as a placebo. This had no effect on his disability. He was then given neostigmine methylsulfate, 2 cc. of 1:2,000 solution, and atropine sulfate 1/150 grain daily for two weeks. The neostigmine resulted in moderate improvement. The pain was no longer constant, the patient being free from it about half the time; pain was not induced as readily by activity, and he no longer limped. Three weeks after injections were discontinued this improvement was retained. Neostigmine methylsulfate, 3 cc. of 1:2,000 solution, and atropine sulfate 1/100 grain were administered daily for five weeks. For the first two weeks the patient was entirely free from pain in the back for the first time since the injury. During the last three weeks of this course of treatment he was free from pain most of the time. Strength in the lower extremities showed a significant increase. Pain recurred after therapy was discontinued.

A roentgenogram taken in March, 1945 showed that no change had taken place in nine months. There were deformity of the body of the third lumbar vertebra (fig. 1) and nonunited fractures of the left transverse processes of the second and fourth lumbar vertebrae.

Case 26. — C., a man aged 51, had a compression fracture of the first lumbar vertebra in May, 1943. After one and one-half years of treatment, including immobilization, the wearing of a brace and physical therapy, the patient had a severe disability. A roentgenogram taken in December, 1944 revealed deformity and compression of the body of the first lumbar vertebra and union of the bodies of the first lumbar and twelfth thoracic vertebrae by callus (fig. 2). At this time the patient suffered

from severe shooting pains down the lateral aspect of the right leg into the toes, which frequently interfered with sleep. He also had aching in the back and right hip which was accentuated by activity. There was marked weakness of the right lower extremity, and he fatigued readily. There was an area of hyperesthesia on the lateral aspect of the right thigh. There was moderate limitation of forward bending and lateral flexion

Fig. 1. — Roentgenogram of the lumbar region of the spine in case 25 fifteen months after the fracture. Note compression fracture of the third lumbar vertebra. There were also nonunited fractures of the left second and fourth lumbar transverse processes.

Fig. 2. — Roentgenogram of the lumbar region of the spine in case 26 a year and a half after the fracture. Note deformity and compression of the body of the first lumbar vertebra and union of the bodies of the first lumbar and twelfth thoracic vertebrae by callus.

of the spine. The patient was unable to put on or remove his own socks and shoes, could not stand up on a chair on the right leg and had great difficulty in squatting and in walking on the toes.

Daily intramuscular injections of neostigmine methylsulfate, 2 cc. of 1:2,000 solution, and atropine sulfate 1/150 grain were begun in December, 1944 and continued for one month. During the period of treatment the shooting pains disappeared and the patient no longer had pain which interfered with sleep. The limitation of motion and pain in the back showed moderate improvement. He was able to put on and remove his socks and shoes, stand up on a chair on the right leg and walk on his toes with ease. There was a striking improvement in strength in the muscles of the right lower extremity. Three months after therapy was discontinued the improvement had been retained.

Case 27. — B., a man aged 30, had had a compression fracture of the second lumbar vertebra seven months before examination. He had continuous severe pain in the lumbar region, and there were pronounced rigidity and lordosis which failed to respond to rest and physical therapy. A roentgenogram revealed almost complete disintegration and resorption of the lower half of the body of the second lumbar vertebra.

He was given neostigmine methylsulfate, 3 cc. of 1:2,000, solution and atropine sulfate 1/100 grain by intramuscular injection twice daily for nine days. This treatment resulted in disappearance of the pain and a significant increase in straight leg

raising. There was no change in the rigid lordotic lumbar spine. One week after the treatment was stopped there had been no recurrence of the low back pain.

CASE 28. — H., a man aged 34, had pain and limitation of motion of the lumbar region as a result of fracture of the right transverse processes of the third and fourth lumbar vertebrae three months before. A roentgenogram revealed myositis ossificans joining the fractured transverse processes. During ten days of neostigmine therapy the pain disappeared, the mobility of the lumbar part of the spine improved. One week after cessation of therapy the improvement had been retained.

CASE 29. — A., a man aged 45, had had a compression fracture of the first lumbar vertebra, bilateral fractures of the ischium and fracture of the sacrum eleven months before examination. He complained of pain in the back and walked with a limp. No significant improvement followed physical therapy. Daily injections of saline solution as a placebo for one week were followed by moderate improvement in gait but no change in the pain. Daily injections of neostigmine methylsulfate, 2 cc. of 1:2,000 solution, and atropine sulfate 1/150 grain for two weeks had no effect on his disability.

CASE 30. — W., a man, had an old fracture of the transverse process of the third lumbar vertebra and complained of pain in the back. He did not improve with physical therapy. No significant change was noted after injection of neostigmine methylsulfate, 1 cc. of 1:2,000 solution, with atropine sulfate 1/150 grain twice daily for one week.

CASE 31. — F., a woman aged 49, fell and fractured the coccyx in October, 1944. She was treated with physical therapy and manipulation, with some improvement in symptoms. Five months after the injury she still had pain in the coccygeal region and down the posterior aspect of the left leg. She had had to take acetylsalicylic acid and codeine every day since the injury for relief of pain. There was no limitation of motion.

Neostigmine methylsulfate, 2 cc. of 1:2,000 solution, with atropine sulfate 1/150 grain was given by intramuscular injection once daily for two weeks. For the first time since the accident the patient did not require acetylsalicylic acid or codeine for relief of pain. After one week she still had slight back pain on bending forward. After two weeks of therapy the pain completely disappeared.

CASE 32. — P., a man aged 52, in July, 1944 fell 30 feet and suffered compression fractures of the twelfth thoracic and first lumbar vertebrae, as well as fracture of the right tibia. Seven months later he was having constant pain in the back, localized in the region of the first lumbar vertebra, which interfered with sleep. There was marked rigidity of the lower thoracic and the lumbar portions of the spine. The patient could bend forward to reach to 14 inches from the floor. His condition had showed no change for the four months.

Neostigmine methylsulfate, 2 cc. of 1:2,000 solution, and atropine 1/150 grain were injected intramuscularly once daily for three weeks. The patient was able to sleep better, the back pain was less constant and somewhat less severe and he could bend to reach to 10 inches from the floor. There was a definite increase in strength in the right lower extremity.

While there was some definite improvement, this patient was considered as not showing significant improvement from neostigmine therapy.

C. *Acute Low Back Pain.* — In 15 cases of acute low back pain resulting from lumbosacral strain (12 cases) or acute intramuscular fibrositis (3 cases) have been given a trial of neostigmine therapy. All of the patients had severe pain, demonstrable muscle spasm and marked limitation of motion of the lumbar portion of the spine. There were no fractures, nor was there evidence of severe injury to the soft tissues of the lower part of the back. Eleven of the patients showed rapid improvement and relief from symptoms during the period of treatment and retained the improvement after therapy was discontinued. The observations suggest that neostigmine may be an effective means of therapy for acute low back strain and intramuscular fibrositis. Further studies with controls will be necessary for more definitive evaluation of this treatment in acute cases.[16]

16. Two other physicians have used neostigmine at our suggestion in the treatment of acute low back pain. Senior Assistant Surgeon (R) Samuel Steinberg, of the United States Marine Hospital, New York, has stated in a personal communication that he has had good results with neostigmine therapy in cases of acute nontraumatic and mild traumatic low back pain but has not had good results in cases of severe traumatic pain. Dr. O. A. Engh, orthopedic surgeon of Washington, D. C., has stated in a personal communication that he has had excellent results with neostigmine in the treatment of acute low back pain. In some cases the disability rapidly disappeared with neostigmine treatment alone. In other cases the patients, while definitely benefited, were not completely relieved; however, neostigmine therapy made it possible in these cases to carry out manipulation which resulted in recovery.

Three case reports of acute low back pain treated with neostigmine are presented.

Case 33. — C., a woman aged 56, had lumbosacral strain resulting in severe pain, marked limitation of motion and spasm of the erector spinae, which had persisted without improvement for one week. She could hardly bend forward at all and had great difficulty in walking and sleeping. The symptoms had not been relieved by strapping with adhesive tape, by heat or by use of codeine.

At bedtime the patient took neostigmine bromide 15 mg. and atropine sulfate 1/200 grain orally. On arising the next morning she took neostigmine bromide 30 mg. and atropine sulfate 1/200 grain. By noon, there was marked relief from pain and limitation of motion, so that the patient was able to drive 40 miles, attend a party and drive back home. Seen at 6 p. m., she was free from pain and muscle spasm and could bend over and touch her toes. She had no further treatment and there was no recurrence of the disability.

Case 34. — M., a woman aged 38, had a sudden onset of sacroiliac pain on the left while she was walking upstairs. There were marked spasm of the lumbar muscles on the left side, severe pain and great difficulty in locomotion. The pain prevented sleep. No relief was obtained from rest and diathermy. Three days after the onset, at 10:30 a. m., neostigmine methylsulfate, 2 cc. of 1:2,000 solution, and atropine sulfate 1/150 grain were administered intramuscularly in the arm. By 3 p. m. there was considerable relief, the pain had almost disappeared and the patient could bend over easily and had little difficulty in locomotion. That night she slept well. The next morning there was no low back pain except on flexion of the left hip, as in driving a car. Another injection of neostigmine and atropine was followed by disappearance of this pain within a few hours. The improvement was retained without further treatment.

Case 35. — K., a woman aged 30, had acute intramuscular fibrositis of the right lumbar region, which she attributed to exposure to a draft after a hot bath. After two days there were severe pain and muscle spasm, tilted pelvis, scoliosis and limitation of motion. No relief was obtained from rest and application of heat. At 2 p. m. neostigmine bromide 30 mg. and atropine sulfate 1/200 grain were administered orally. By 5 p. m. the symptoms had disappeared except for a slight ache. The deformity and limitation of motion were no longer present, and the patient was able to walk and dance without difficulty. The improvement was retained without further therapy.

Eight other patients with acute low back pain of one to ten days' duration showed striking relief from muscle spasm and pain after one or two injections of neostigmine and atropine. In 4 patients with acute lumbosacral strain, either the results of neostigmine therapy were equivocal or no improvement was observed.

Comment

It is evident from the results reported that neostigmine may have a striking therapeutic effect in cases of acute and chronic backache. Relaxation of muscle spasm, relief from low back pain, increased mobility and increased strength have been observed in favorable cases. It is of particular interest that improvement may occur in patients with fracture of a lumbar vertebra with pathologic change demonstrable by x-ray examination (figs. 1 and 2). In chronic cases in which there has been no response to other forms of therapy over a long period, the rapid relief of symptoms during neostigmine therapy is convincing. In acute cases of low back strain the rapid recovery coinciding with initiation of neostigmine administration is suggestive.

The mechanism of action of neostigmine should be understood if this drug is to be used properly as an adjunct in the treatment of low back pain. At the present time it is believed that the primary effect of neostigmine is to inhibit the enzyme cholinesterase and thereby to decrease the rate at which acetylcholine is decomposed and rendered physiologically inactive.[13] This enzyme inhibition allows acetylcholine to accumulate in greater concentration at cholinergic nerve endings throughout the body. The action of

neostigmine in low back pain cannot be understood if the drug is thought of in the conventional way, solely as a parasympathetic nerve stimulator. The stimulation of the parasympathetic nerves by neostigmine is to a large extent nullified by atropine, yet patients with backache have responded to a combination of the two drugs. The stimulating effect of neostigmine on transmission at the myoneural junction also fails to explain many of the phenomena observed in the course of this investigation. The observations can best be explained as manifestations of the action of neostigmine on the central nervous system.

Schweitzer and Wright[4] demonstrated in animal experiments that neostigmine, acting directly on the spinal cord, has an inhibitory effect on the knee jerk and can inhibit strychnine convulsions. These central nervous system effects were not influenced by administration of atropine. The action of neostigmine on the central nervous system was considered the result of inhibition of cholinesterase.

Kremer[5] administered neostigmine, and neostigmine and acetylcholine, intrathecally to patients with hemiplegia. The spasticity and hyperactive deep reflexes were strongly depressed by neostigmine. Evidence was presented that the effects observed were the result of action of the drug directly on the spinal cord. Large doses of acetylcholine in the spinal fluid were without effect. Small doses of neostigmine greatly augmented the action of acetylcholine and brought about inhibition of spasticity and deep reflexes. These observations led to the conclusion that neostigmine has a powerful inhibitory action on the central nervous system by virtue of inhibiting cholinesterase and allowing accumulation of acetylcholine at synapses. Ward and Kennard[17] reported that monkeys subjected to excision of the motor cortex recovered motor function more rapidly when given a cholinergic drug (doryl). The effect was not blocked by atropine and the improvement persisted after administration of the drug was discontinued. They suggested that the acceleration of recovery of motor function was the result of inhibition of cholinesterase at synapses in the central nervous system. In patients with poliomyelitis, Kabat and Knapp[6] observed relaxation of muscle spasm from intrathecal administration of neostigmine and attributed the therapeutic effects of subcutaneous and oral administration of the drug in poliomyelitis to its action on the central nervous system.

In the present investigation of neostigmine therapy, relaxation of muscle spasm and relief from pain were observed in acute and chronic cases of low back pain. There is no evidence that neostigmine, acting alone, is an analgesic or sedative,[13] although augmenting of the action of morphine by neostigmine has been reported by Slaughter.[18] It is known that muscular hypertonus can cause pain.[19] In poliomyelitis, relaxation of muscle spasm by curare and similar drugs brought relief from pain.[20] In cases of backache, relief from pain coincided with relaxation of muscle spasm during neostigmine therapy. It appears likely that the muscle spasm was responsible for the pain and that the relief of pain by neostigmine in these cases was secondary to the relaxation of muscle spasm.

Relaxation of muscle spasm by neostigmine in patients with low back pain appears to be the result of action of the drug on the central nervous system. This action is inhibitory to muscle tonus and proprioceptive re-

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flexes[4] and is capable of producing relaxation of spasticity[5] and of muscle spasm.[6] Spasm of the back muscles relaxed after administration of neostigmine together with atropine; the action of neostigmine on the central nervous system is not affected by atropine.[4] The improvement was usually retained after administration of neostigmine was discontinued; the central action of another cholinergic drug in experimental hemiplegia was followed by retention of the improvement after cessation of treatment.[18] The effects of neostigmine on back pain appeared more slowly and persisted longer than the action of this drug at parasympathetic nerve endings or at the myoneural junction.[13]

The application of neostigmine as an adjunct in the treatment of backache is apparently dependent on the inhibitory action of the drug on muscle spasm. Pain originating in bones, joints, ligaments, nerves, etc., and not related to muscle spasm will not respond. The failure of neostigmine to relieve pain and disability in acute rheumatoid arthritis[8] suggests that this drug will not be of value in cases of backache associated with active inflammation in the tissues of the back. Thus the field of usefulness of neostigmine is limited to backache in which reflex muscle spasm plays an important role. In many cases of backache the importance of muscle spasm is obvious; in other cases, while pathologic changes in the spine are evident in the roentgenogram, reflex muscle spasm secondary to these changes may represent a major factor in the disability.

Summary

1. Neostigmine was administered in 47 cases of low back pain. Relief of pain, increase in range of motion, relaxation of muscle spasm and increase in strength were observed. The improvement as a rule was retained after therapy was discontinued.

2. Fifteen of 24 patients with chronic backache who had failed to respond to other forms of treatment showed significant improvement from neostigmine therapy. The duration of the disability in these cases ranged from one month to twenty years. A series of injections of saline solution as a placebo administered to one group of patients failed to influence the disability.

3. Five of 8 patients with chronic disability from fracture of a lumbar vertebra showed significant improvement with neostigmine therapy.

4. Eleven of 15 patients with acute low back pain from lumbosacral or sacroiliac strain or from intramuscular fibrositis were relieved rapidly by neostigmine therapy.

TREATMENT OF SCIATICA WITH ALTERNATING CURRENT *

ABRAHAM COHEN, M.D.
FRANCIS P. NASELLI, B.S., P.T.
and
MARIE P. CRAIG, B.S., P.T.
PHILADELPHIA

The term sciatica is usually applied to any condition characterized by pain in the lower back radiating down one or both legs. This distressing symptom complex sometimes incapacitates the patient for weeks or even months. Any procedure that will help to alleviate the suffering caused is desirable.

It is not within the scope of this paper to delve into the various etiologic factors in sciatica. One can obtain information concerning these from any good textbook on the subject. However, it should be remembered that the method suggested is not intended to replace surgical intervention, physical therapy or drugs. Its purpose is to add to rather than subtract from the already long list of procedures for the treatment of sciatica.

Our criteria for the diagnosis of sciatica are as follows:

1. Pain and tenderness along the course of the sciatic nerve.
2. Diminished patellar reflex on the affected side.
3. Presence of the Laségue sign.

Although the method to be described is not new, having been suggested by others,[1] we wish to emphasize its efficacy, since use of the alternating current is simple and free from danger and can be carried out in the physician's office.

TECHNIC. — The accompanying illustrations provide a graphic description of the apparatus and the method of application.

If the patient can assume the standing position, the foot of the involved extremity is placed on a 6 by 10 inch metal electrode (fig. 1, *E*-1) covered with absorbent cotton saturated with tap water. The active electrode is 2 by 3 inches. These are now connected to the instrument. The active electrode is then applied to the sacroiliac joint or the sciatic notch on the affected side. The current is turned on slowly until the patient's tolerance is reached (usually about 10 volts). Treatment consists of twenty to sixty seconds at each point.

With the patient in the recumbent position the electrodes are applied the same way except that with the patient lying on the abdomen or side it is necessary to bind the electrode to the sole of the foot or to apply a smaller electrode to the achilles tendon.

When the maximum current is applied there is a contraction of the muscles of the limb with a minimal amount of discomfort. Relief is usually obtained immediately and may persist for a few days; however, treatment is usually administered every other day until relief is complete. In acute cases, such as those in which sciatica accompanies back strain, relief may be complete after two or three treatments. In the more chronic types, treatment requires a longer period. In either type a measure of relief is assured regardless of the cause. Thus far some 25 patients have been treated by the method. These are summarized in the accompanying table.

* From the arthritis clinics of the Philadelphia General Hospital and Jefferson Medical College Hospital and the special arthritis wards and the Department of Physical Medicine of the Philadelphia General Hospital.

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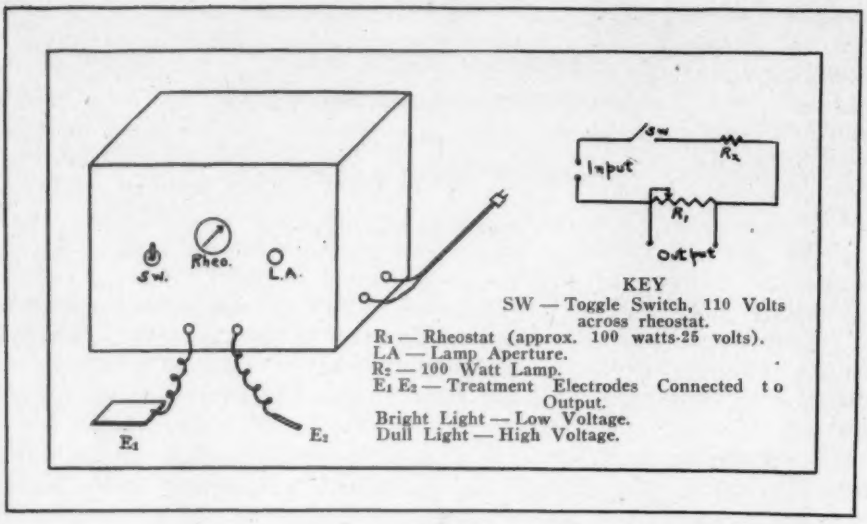

Fig. 1. — The instrument.

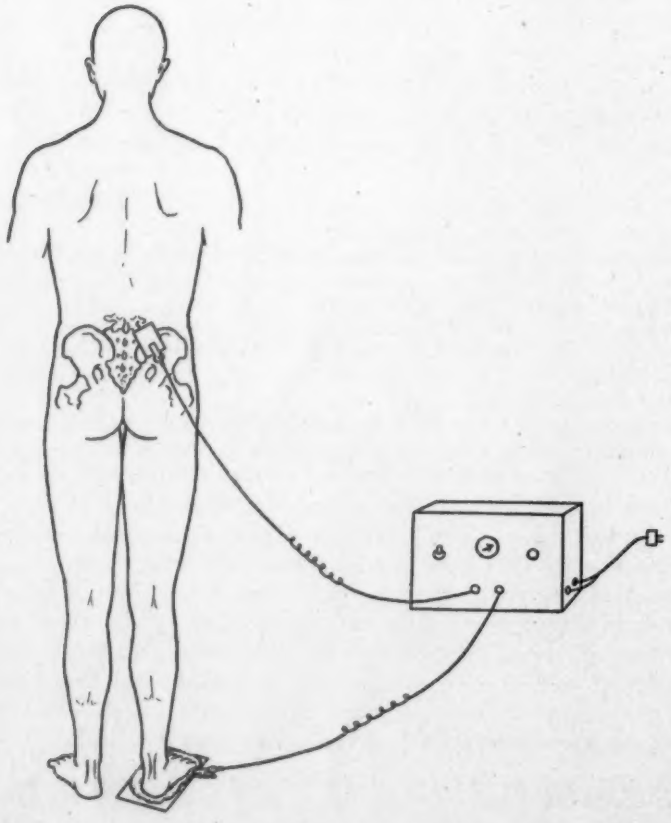

Fig. 2. — Method of application.

Summary of Cases

Case	Etiologic Diagnosis	Duration of Illness	Number of Treatments	Frequency of Treatments	Duration of Treatment	Result
1	Right sciatica	10 yr.	4	Every other day	1 wk.	Complete recovery
2	Right sciatica	2 wk.	4	Every other day	1 wk.	Improvement
3	Left sciatica	1 wk.	2	Every third day	3 days	Complete recovery
4	Left sciatica (traumatic)	4 mo.	7	Every other day	2 wk.	Relief
5	Right sciatica	2 mo.	7	Twice a week	4 wk.	Complete recovery
6	Sciatica of right leg	3 yr.	10	Every other day	1 mo.	Complete recovery
7	Sacroiliac strain; right sciatica	1 day	8	Every other day	3 wk.	Complete recovery
8	Left sciatica	1 day	11	Daily	11 days	Relief
9	Left sciatica (traumatic)	1 day	25	Every other day	3 mo.	Relief
10	Left sciatica	4 wk.	20	Daily	3 wk.	Complete recovery
11	Left sciatica	3 yr.	6	Once a week	6 wk.	Complete recovery
12	Right sciatica	2 wk.	4	Once a week	1 mo.	Complete recovery
13	Bilateral sciatica	3 wk.	9	Every other day	1 wk.	Complete recovery
14	Left sciatica	1 wk.	3	Every other day	1 wk.	Relief
15	Right sciatica (traumatic)	1 day	11	Every other day	3 wk.	No response
16	Left sciatica	3 mo.	29	Daily	1 mo.	Relief
17	Left sciatica; sacroiliac strain	7 days	3	Every other day	6 days	Relief
18	Right sciatica with sacroiliac arthritis	10 mo.	21	Every other day	7 wk.	Tenderness still-exists in sacroiliac joint; sciatica relieved
19	Sciatica; rheumatoid arthritis	1½ yr.	10	Every other day	4 wk.	Sciatica relieved
20	Sciatica; rheumatoid arthritis	6 mo.	15	Every other day	4 wk.	Sciatica relieved
21	Right sciatica	1 yr.	4	Daily	1 mo.	Complete recovery
22	Right sciatica	3 mo.	18	Daily	3 wk.	Immediate relief
23	Left sciatica	4 mo.	3	Every other day	1 wk.	Relief
24	Right sciatica	7 yr.	19	Twice a week	10 wk.	Relief
25	Left sacroiliac joint disease with sciatica	5 mo.	14	Twice a week	7 wk.	Complete recovery

On a physiologic basis there is little that can be offered to explain why relief occurs. Temporary muscle contraction is evident in both the flexor and the extensor muscles along the entire course of the sciatic nerve distribution. Could this phenomenon be due to stretching of the sciatic fibers? We have not been able to prove or to disprove the point. However, it is indeed possible that the type of reaction obtained by means of Buck's extension is elicited here with the electric current.

In none of the cases tabulated was it necessary to maintain absolute rest in bed. In only a few was time lost from work after treatment was begun.

Thus far we have not had an opportunity to try the method in sciatic neuralgia, for example that produced by a central lesion such as an intervertebral disk herniation or a tumor of the cord. Our cases were limited to instances of neuritis or perineuritis of the sciatic nerve.

Summary and Conclusions

1. The alternating current is a simple, safe procedure for the treatment of sciatica.
2. Twenty-five patients were treated successfully without being confined to bed.
3. The patient becomes ambulatory almost immediately.
4. The method is simple enough to be carried out in any physician's office.

The Department of Physics of the Philadelphia General Hospital helped design and make the instrument as described.

PENICILLIN COMBINED WITH FEVER THERAPY **

A Preliminary Report of Twenty Cases of Early Syphilis

ROBERT H. CRAIG, M.D.*

GEORGE X. SCHWEMLEIN, M.D.*

and

H. WORLEY KENDELL, M.D.†

CHICAGO, ILL.

The available literature offers few reports concerning penicillin-fever therapy. Barksdale[1] stated that penicillin combined with fever therapy was being satisfactorily used in cases of neurosyphilis. Struble and Bellows[2] reported on the favorable result obtained by the application of penicillin-fever therapy in a case of iridocyclitis of gonorrheal origin which had not responded to penicillin alone. Riba and co-workers[3] applied the cabinet type of thera-

From the Section on Fever-Chemotherapy, Chicago Intensive Treatment Center, Venereal Disease Control Program, Chicago Board of Health in cooperation with the United States Public Health Service.

* Passed Assistant Surgeon (R) United States Public Health Service.

† Surgeon (R), United States Public Health Service; now director of State Fever Therapy Unit, Brookhaven, Miss.

** Reprinted, J. Lab. & Clin. Med. 30:1016 (Dec.) 1945.

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peutic fever and penicillin to gonorrhea complications which had not responded to penicillin alone with encouraging results.

These data were not considered sufficient evidence that larger amounts of penicillin could be safely combined with physically induced fever or that penicillin activity could be demonstrated in the blood before, during, and after this type of therapeutic fever.

Physically induced fever combined with arseno-bismuth preparations has been employed by us in the intensive treatment of early syphilis[4-5] and satisfactory clinical and serologic results have been obtained. It was observed that by increasing the amount of these chemotherapeutic agents, fewer treatment failures occurred. Toxic reactions, however, were in direct proportion to the amounts of arsenical and/or bismuth[6] used in combination with therapeutic fever at the 106.0 F. (rectal) level.

It was natural, therefore, to combine penicillin with this form of fever therapy, substituting a chemotherapeutic agent whose toxicity has been negligible[7-8-9] as compared to arseno-bismuth preparations which have certain limitations when administered alone in large doses or in combination with therapeutic fever.

Twenty patients having primary or secondary syphilis (dark-field positive) were given penicillin-fever therapy. The amount of fever for each patient was three hours at 106.0 F. (rectal) level, produced in an air-conditioned cabinet (hypertherm). The sodium salt of penicillin was administered in the prefever period and during the course of the therapeutic fever. The patients all received a thorough diagnostic medical survey and the routine prefever preparation and postfever care.[10]

The first five patients received 25,000 units of penicillin intramuscularly by syringe every two hours during the twenty-four hours of the prefever period, a total of 300,000 units. The last dose was administered at 6:00 a. m. and the patients were in the fever cabinets at 8:15 a. m., reaching the 106.0 F. (rectal) level at approximately 9:15 a. m. Penicillin was administered intravenously by syringe in 100,000 unit doses at this time and again at the beginning of the second and third hours of the maintained fever. The amount of penicillin administered during fever therapy was 300,000 units, and the total amount for each patient was 600,000 units.

A second group of five patients was given the same routine treatment except that the penicillin was administered intramuscularly by syringe in 50,000 unit doses every four hours in the twenty-four hour prefever period.

Three of these ten patients had short periods of temperature elevation within the range of from 100.4 to 104.2 F. during the prefever penicillin administration. They were not ill and this was considered to be the Herxheimer reaction. During fever therapy nine of the patients showed no reactions. One patient (No. 6848) who had previously denied any drug ad-

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diction suddenly demanded a narcotic and became uncooperative when this was refused (he later admitted addiction); his treatment was discontinued for this reason after one and three-quarter hours of therapeutic fever. During the three postfever days all of the patients were ambulatory and in good condition.

In view of these favorable observations, it was decided to increase the total amount of penicillin to 1.2 million units for each of ten additional patients, 600,000 units to be administered in the twenty-four hour prefever period and 600,000 during fever therapy.

The patients were given the same routine fever therapy as was previously described. Penicillin was administered intramuscularly by syringe in 50,000 unit dosages every two hours in the twenty-four hours of the prefever period and 200,000 units intravenously by syringe at the height of fever and at the beginning of the second and third hours of maintained fever.

During the prefever penicillin administration one patient had a short period of temperature elevation to 100.2 and another to 101.8 F. These patients were not ill and this was interpreted to be the Herxheimer reaction. There were no reactions during fever therapy and the patients were alert and ambulatory during the postfever days.

In comparing the twenty patients treated with penicillin-fever therapy to patients receiving arsenicals, bismuth, and fever-therapy, it was observed that during the fever, minor reactions were not evident and the patients water balance was much less disturbed, and during the postfever period there was an absence of lethargy and fatigue with the penicillin-fever combination.

Blood penicillin determinations were made on twelve patients by the method described by Heilman and Herrell.[11] Blood specimens* were obtained from the antecubital vein after twelve and twenty-four hours of prefever penicillin administration, at the beginning of the maintenance period, and after one and two hours of maintained fever immediately before the intravenous penicillin was administered. Specimens were also obtained at approximately 8:00 a. m. on the first two consecutive postfever days. It is shown in Table 1 that penicillin activity in the blood is present during fever therapy and that there is marked variation in the values secured.

The clinical results obtained by these therapeutic methods have been of interest to us and have formed the foundation for further study of the combination of fever and penicillin in the treatment of early syphilis. The immediate clinical response to these three schedules of treatment was the same as evidenced by any form of intensive treatment of syphilis. The lesions became negative for the *Treponema pallidum* on dark-field microscopy and healed. This will occur after penicillin in amounts of 60,000 units[12] is administered and should be expected after the amounts used in this study.

There are no reports to our knowledge on the treatment of early syphilis using 600,000 or 1.2 million units of penicillin within a period of forty-eight hours. Such amounts of penicillin have usually been administered over a period of seven and one-half days. The immediate clinical results with such schedules have been the same as experienced in this group of patients. This fact allows us only one method of comparison and that is the relapse rate.

The indicated eventual relapse rate using 600,000 units of penicillin over seven and one-half days is 40 per cent.[13] The ten patients treated with 600,000

* The blood penicillin specimens were sent by air mail to the Mayo Clinic and the determinations performed under the direction of Dr. Paul O'Leary, Section on Dermatology, and Dr. D. H. Heilman, Division of Clinical Pathology, to whom we are indebted.

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TABLE 1. — *Penicillin Levels (O. U. of Antibacterial Activity Per Cubic Centimeter of Blood).*

	Prefever			Fever				Postfever	
Patient	Intramuscular Sodium Penicillin Administration	12 Hr. After Initiation of Penicillin	24 Hr. After Initiation of Penicillin	Intravenous Sodium Penicillin Administration	Beginning of Maintenance Period	After One Hour	After Two Hours	8:00 A. M. First Day Postfever	8:00 A. M. Second Day Postfever
5212	25,000 O.U. q. 2 h. in 24 hr. prefever	0.48	0.06	100,000 O.U. after each blood specimen	None	0.24	0.48	None	None
6643	25,000 O.U. q. 2 h. in 24 hr. prefever	0.24	0.06	100,000 O.U. after each blood specimen	0.06	15.36	0.48	None	None
6654	25,000 O.U. q. 2 h. in 24 hr. prefever	0.48	0.06	100,000 O.U. after each blood specimen	0.06	30.00	15.36	None	None
6787	25,000 O.U. q. 2 h. in 24 hr. prefever	0.06	0.06	100,000 O.U. after each blood specimen	None	0.24	0.48	None	None
6801	25,000 O.U. q. 2 h. in 24 hr. prefever	0.48	0.03	100,000 O.U. after each blood specimen	None	0.24	0.48	None	None
6826	50,000 O.U. q. 4 h. in 24 hr. prefever	0.03	0.03	100,000 O.U. after each blood specimen	None	0.96	0.96	None	None
6830	50,000 O.U. q. 4 h. in 24 hr. prefever	0.24	0.03	100,000 O.U. after each blood specimen	None	0.48	0.96	None	None
6839	50,000 O.U. q. 4 h. in 24 hr. prefever	0.24	0.06	100,000 O.U. after each blood specimen	None	0.12	0.24	None	None
6848	50,000 O.U. q. 4 h. in 24 hr. prefever	0.48	0.03	100,000 O.U. after each blood specimen	None	15.36	0.48	None	None
6995	50,000 O.U. q. 4 h. in 24 hr. prefever	None	0.12	100,000 O.U. after each blood specimen	Trace	0.96	1.92	None	None
7523	50,000 O.U. q. 2 h. in 24 hr. prefever	0.24	0.24	200,000 O.U. after each blood specimen	0.03	0.96	1.92	None	None
7946	50,000 O.U. q. 2 h. in 24 hr. prefever	0.48	0.12	200,000 O.U. after each blood specimen	None	0.48	0.48	None	None

units of penicillin in two days and three hours of fever at 106 F. (rectal) exhibited a relapse rate of 80 per cent. Although the group is small, the failure of eight of ten patients is certainly significant; all failures occurred within the first six months after treatment, further proof of the inadequacy of this treatment schedule. The results in this group are shown in Table 2.

The indicated eventual relapse rate using 1,200,000 units of penicillin in early syphilis is from 15 to 20 per cent.[13] Two of the ten patients in this study treated by the use of 1,200,000 units of penicillin and three hours of fever at 106 F. (rectal) were not seen again after dismissal from the hospital. Two of the eight patients under observation have been classified as serologic relapses. No clinical failures have appeared in this group of patients. Both serologic failures occurred in the eighth month after treatment, at least two months later than any of the failures with 600,000 units. The clinical results in the group to date are encouraging and further study of the use of 1,200,000 units of penicillin plus physically induced fever are in progress. The serologic status to date of the patients in this group is shown in Table 3.

TABLE 2. — *Number of Patients With Syphilis Treated With Fever and 600,000 Units of Penicillin From July 26 Through Aug. 24, 1944, Grouped by Final Diagnosis and Last Reported Status Prior to July 1, 1945.*

Last Reported Status	Total	Diagnosis	
		Primary Seropositive	Secondary
Total	10	2	8
Negative	1	1	....
Positive—1 to 4 units	....	....	....
Positive—Over 4 units	1	....	1
Failures	8	1	7
Failures			
Total	....	8	....
Clinical relapse	5	....	....
Cliniual progression	1	....	....
Serologic relapse	2	....	....

TABLE 3. — *Number of Patients With Syphilis Treated With Fever and 1.2 Million Units of Penicillin From Oct. 2 Through Nov. 8, 1944, Grouped by Final Diagnosis and Last Reported Status Prior to July 1, 1945.*

Last Reported Status	Total	Diagnosis	
		Primary Seropositive	Secondary
Total treated	10	2	8
Not reporting	2	....	2
Total under observation	8	2	6
Negative	3	2	1
Positive—1 to 4 units	1	....	1
Positive—Over 4 units	2	....	2
Failures (serologic relapse)	2	....	2

Summary

1. Preliminary evidence is presented to demonstrate that penicillin and physically induced fever may be safely combined in the treatment of early syphilis as described.

2. Penicillin-fever therapy as compared to arseno-bismuth-fever therapy was more comfortable for the patients.

3. Blood penicillin activity during penicillin-fever therapy was variable before and during this form of therapy, while none was detected on the two consecutive mornings after fever therapy.

4. The use of 600,000 units of penicillin plus three hours of fever at 106 F. (rectal) is inadequate treatment for early syphilis.

5. The use of 1,200,000 units of penicillin plus three hours of fever at 106 F. (rectal) is encouraging enough to warrant further study of the use of penicillin-fever therapy in early syphilis.

THE ARMY MEDICAL LIBRARY

The late Dr. William H. Welch, eminent pathologist of Johns Hopkins University, said: "I have been asked on more than one occasion what have been the really great contributions of this country to medical knowledge. I have given the subject some thought and believe that four should be named: (1) the discovery of anesthesia; (2) the discovery of insect transmission of disease; (3) the development of the modern public health laboratory in all that the term implies; (4) the Army Medical Library and its Index-Catalogue.

The Army Medical Library had its beginnings in 1836 while Joseph Lovell was The Surgeon General. It remained a small collection of medical books and pamphlets in the Office of The Surgeon General for some thirty years. In 1865, Dr. John Shaw Billings who had been an Army Surgeon in the Civil War, became an assistant to Surgeon General Joseph K. Barnes. Under Billings' guidance, the Library as a great research institution got its start.

From 1865 to 1887, the Library was housed as a part of the Army Medical Museum in the old Ford's Theatre on Tenth Street in which President Lincoln had been assassinated. In 1868, it boasted five thousand volumes.

The Surgeon General reported in 1879 that there were fifty thousand books on the shelves, and the following year recommended that a building be constructed to house the Library's expanding collection, to cost $250,000.00. This building, located at 7th and "B" Streets (now Independence Avenue) S.W. and still occupied by the Library, was completed in 1887.

Under the direction of The Surgeon General, Dr. Billings published in 1876 a *Specimen Fasciculus* showing the style and arrangement planned for the *Index-Catalogue*. In the next four years, with the assistance of Dr. Fletcher, he worked at preparing the copy of the first *Index-Catalogue*, the greatest medical bibliography which began to appear in 1880.

One year before the publication of the *Index-Catalogue*, Dr. Billings and Dr. Fletcher hit upon another bibliographical expedient intended to give physicians a classified record of the current medical literature of the world, month by month. This was the *Index Medicus*, the editorial management of which was principally in the hands of Dr. Fletcher. The first monthly number of this publication was issued on January 31, 1879. Except for a brief interval, it was carried on until 1927 when it was taken over by the American Medical Association.

Through his untiring efforts, Dr. Billings accumulated a store of medical literary treasures of the 15th, 16th, 17th, and 18th centuries, unobtainable today. His output of 171 medical publications in the course of half a century bear witness to his great energy. Extremely versatile, he was considered a good judge of men, having selected Fletcher and Garrison for the Army Medical Library, and Welch, Osler, and Halsted for the Johns Hopkins.

After thirty years of service to the Library, Colonel Billings departed with his laurels to take his new position as the first Director of the New York Public Library.

From the inception of the Library to the present time, sixteen librarians and two Directors have held office as follows:

Librarians

Colonel J. S. Billings (1868-1895).
Colonel D. L. Huntington (1896-7).
Surgeon J. C. Merrill (1898-1902).
Major Walter Reed (1902 — died in office).
Brigadier General Calvin DeWitt (1903).
Brigadier General W. D. McCaw (1903-13).

Colonel C. C. McCulloch, Jr. (1913-18).
Brigadier General F. A. Winter (1918-19).
Colonel P. E. Straub (1919).
Major General R. E. Noble (1919-24).
Colonel J. M. Phalen (1924-27).
Colonel P. M. Ashburn (1927-32).
Major Edgar Erskin Hume (1932-6).
Colonel Harold W. Jones (1936-July 1944).

In July 1944, the offices of The Director and The Librarian were created, to be occupied by an Army Medical Officer and a career librarian, respectively. The following is a list of The Directors and The Librarians:

Colonel Harold W. Jones, The Director (July 1944-Aug. 1945).
Colonel Leon L. Gardner, The Director (Sept 1945-).
Captain Francis R. St. John, Acting The Librarian (July 1944-June 1945).
Mr. Wyllis E. Wright, The Librarian (July 1945-).

After Billings' departure, we find that in a period of eight years there were five Librarians, one serving for four years and the others averaging about a year. Fortunately, Dr. Robert Fletcher remained until his death in 1912, assisting in the work of the *Index-Catalogue* and as editor of the *Index Medicus*. Subsequently, Dr. Fielding Garrison took over the work of the *Index-Catalogue* and later became editor of the *Index Medicus* (1912-27).

Since Billings' time, the *Index-Catalogue* has had only four editors — Fletcher, Garrison, Allemann, and Mayer.

In 1933, a proposal was laid before the President by petition of certain members of Congress to transfer the Army Medical Library to the Library of Congress. Through the opposition of the Librarian of Congress, The Surgeon General and the medical profession, this was prevented. During the depression years, Congress in great measure withdrew its support from the Library. The *Index-Catalogue* had to be suspended for three years.

In 1936, Colonel Harold W. Jones took office, serving for a period of slightly less than ten years. In 1938, after many hearings, a bill was introduced to provide a new Library and Museum Building.

Its location was definitely settled when in 1941 Congress passed a bill authorizing a new Library and Museum to be located on Capitol Hill. It had appropriated a year before, the sum of $130,000.00 for plans to be drawn.

The war with Japan dashed all hopes of the immediate erection of the new building which was so badly needed. But the demands of war made it essential that the Library's services, in spite of inadequate space and inadequate personnel, be greatly expanded.

These demands were met through a reorganization of the staff and by moving a part of the Library to another city, not only for safety but for the ultimate preservation of the books which had suffered severely by lack of proper housing.

The Cleveland Branch of the Army Medical Library was established in July 1942, in the Allen Memorial Medical Library where space was provided to house 90,000 volumes. A Cleveland bookbinding firm was engaged to start the great work of repair and rehabilitation.

In 1945, the Library took over as an official publication the *Current List of Medical Literature*, previously issued as a private publication, although drawing its material from entries prepared for the *Index-Catalogue*. The *Current List* presents each week a general view of the contents of the periodicals received in the Library.

During wartime, the Library has provided a service beyond that which could be expected with the limitations imposed upon it. Through the years, its collections have grown to the point where over a million items, of which over five hundred thousand are bound volumes on every phase of medicine, are available to support medical research. The Library now has 513 of the known medical incunabula. Its personnel has increased within a few years from a mere 30 to 150 of which a large percentage are professional.

During wartime, there was greatly increased reference work for military and naval hospitals. There were many more requests for bibliographical assistance. There was a great increase in photoduplication and the distribution of microfilm to overseas units, for Free China, and for the United States. This latter service was started in 1939.

The Library has not limited its services solely to the military doctor, but serves the public in every way possible. Its loans go to every state in the Union, and its photoduplication service sends microfilm copies of medical literature to every corner of the globe. The *Index-Catalogue* and the *Current List of Medical Literature* continue to be published regularly.

Today's demands for greater medical knowledge have placed heavy responsibilities on the Army Medical Library. To meet these responsibilities and to provide proper housing for its ever expending collection a new and larger building must be secured.

A new Army Medical Library building on Capitol Hill adjoining the Library of Congress occupies a definite place among the projects outlined by the Fine Arts Commission of the District of Columbia as a part of its $400,000,000 postwar program.

Plans for this new Library building have been revised by the present Director, Colonel Leon L. Gardner, and The Librarian, Mr. Wyllis E. Wright, to provide adequate space facilities and services to meet the public's need. Thus, it is hoped that the Army Medical Library will eventually be able to take its rightful place with the Folger Library and the Library of Congress on Capitol Hill. Only in this way can it meet the ever-increasing demands of medical progress.

SCIENTIFIC EXHIBIT SPACE

A limited number of scientific exhibits will again be shown at the 24th Annual Session of the Congress. Please send in your request for an application for such space to the executive offices.

MEDICAL NEWS

Session on Physical Medicine Medical Society, State of New York

On May 1, 1946 in New York City a session on physical medicine will be held in conjunction with the annual meeting of the Medical Society of the State of New York.

This will be presented in the form of a symposium entitled "Physical Medicine in 'Human Reconversion'" and the detail of the program is as follows:

1. "Physical Medicine in Traumatic Injuries"—George G. Deaver, M.D., New York, N. Y.
2. "Physical Medicine in the Treatment of Arthritis and Other Medical Conditions"—L. Maxwell Lockie, M.D., Buffalo, N. Y.
3. "Physical Medicine in Nervous and Mental Conditions" — Lt. Col. Benjamin Simon, M.D., Middletown, Conn.

Colonel Howard A. Rusk

The Distinguished Service Medal was recently awarded to Col. Howard A. Rusk, formerly of St. Louis. The citation accompanying the award states that "Col. Howard A. Rusk, Medical Corps, from March, 1943 to October, 1945 bore the heavy responsibilities of chief of convalescent and rehabilitation branch, Professional Services Division, and chief of the convalescent services division, Office of the Air Surgeon. Given the difficult assignment of pioneering the organization of a convalescent services program in each Army Air Forces hospital, he instituted procedures for physical reconditioning and educational training which utilized previously wasted convalescent time. The results of this far reaching program were extraordinarily successful. Hospital readmissions dwindled, the period of convalescence was shortened, sick leaves were reduced, the military and general knowledge and skills of the patients was increased and tremendous improvement of morale in the hospitalized men was noted. The outgrowth of Colonel Rusk's program was the Air Forces plan for the rehabilitation and convalescent care for returning overseas casualties. Through great vision, superior organizational ability and wide experience gained in the practical application of his theories, Colonel Rusk accomplished a task which benefited thousands of soldiers and contributed in important measure to the success of the Army Air Forces' vast medical program."

Dr. Wilson Tells of Aid for Disabled Veterans and Others

Suggestions for community help for disabled veterans and other severely handicapped persons were made in an address given in Kansas City, Mo., recently by Dr. George D. Wilson of the National Society for Crippled Children and Adults.

"Our main objective in this war was to see that the veterans were not just going back home to sit and wait for government checks," Dr. Wilson said. "In rehabilitation work, you must teach patients to live with their handicaps and teach them they are normal."

Films from the soldiers' hospital showed wounded men beginning to exercise while still in bed.

"You have to encourage the patients and keep them active," he explained. "You have to carry occupational therapy to the bedside of those who can't come to the shop. We didn't regiment the patients. The main thing is getting a man to do something he really likes."

The film showed men working hand looms, making leather goods, doing carpenter work, raising turkeys—even playing golf with clubs strapped to their crutches. Even the army couldn't get all the equipment it wanted, and Dr. Wilson's staff made dumbbells for exercise out of tin cans, loaded with cement and broomsticks.

"That's what we have done," the physician said. "This is what we want to do—carry on in cities and community centers. We have to teach handicapped persons to be self-sustaining and live with their injuries. One agency can't do it alone."

"It is more admirable to start in a small way," Dr. Wilson advised. "You can have physical, occupational, sociological and all kinds of therapy, but you had best use the budget at first where it will do the patient the most good. Start with physical therapy. As soon as people see the amount of good you're doing, the rest of the community will be right behind you.

British Association of Physical Medicine

The British Association of Physical Medicine has now been admitted to the Joint Secretariat for Specialist Associations, established by the Royal College of Surgeons. All correspondence should be addressed to 45 Lincoln's Inn Fields, London, W.C.2.

Sir Stewart Duke-Elder

Those interested in physical medicine will remember the article "Actinotherapy in Disease of the Eye" by Duke-Elder in the *British Journal of Actinotherapy*, July, 1929; "Modern Methods of Treatment in Ophthalmology" in the *Practitioner*, October, 1933 and *Recent Advances in Ophthalmology* published by Blakiston in 1929.

In London recently a modest Scotsman tucked away the symbol of his monarch's deepest gratitude: the Knight Commander's cross of the Royal Vic-

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ARCHIVES of PHYSICAL MEDICINE
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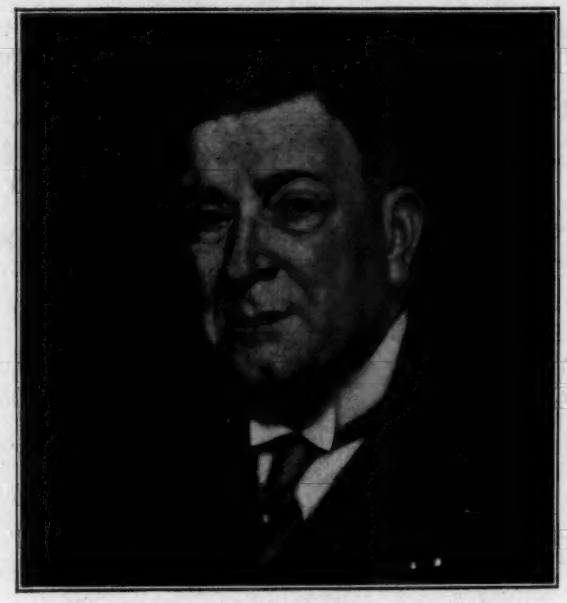
.·. EDITORIALS .·.



Alexander Joseph Rivière, 1859-1946

RIVIERE: SCIENTIST AND HUMANITARIAN

Last month an obituary item flashed over the World press of the death of Dr. Alexander Joseph Rivière, of France, distinguished according to public and official citations as the "pioneer of pioneers" in Physical Medicine and "cosmopolitan" for his struggle against War. By calling a physician and by heart a humanitarian, Dr. Rivière devoted his rich and fruitful years to a crusade against the pain and misery of disease and the futility and economic tragedy of war. His acquaintance spanned the international boundaries, so that his home in Paris became the liaison and the *salon* of a stream of polylinguistic patients and friends as well as the stopping off point of a constant number of visiting physicians, all of whom were assured sympathetic understanding and cordial attention.

The American Congress of Physical Medicine voices its special sorrow through this memorial for the passing of an honored member, and wishes to express its deep respect for the pioneer contributions in physical medicine to a citizen of France whose eminence was officially recognized by our great sister Republic. We pay homage to him as founder and venerable President of the International Medical Association against War, who for many years raised his voice in constant protest against national chauvinism and cried for

international humanitarianism in a day when might was the only conceivable right and righteousness the panacea of dreamers. Rivière had the Prometheus instinct, but unlike the ancient Greeks, it was the people rather than the gods who in a political sense denied him a hearing.

Dr. Rivière graduated as Doctor of Medicine from the University of Paris in 1884, of which he later became a member. His doctorate thesis was "Positivism in Medicine," a plea for scientific objectivity in the practice of medicine, inspired as much by the teachings of the renowned physiologist Claude Bernard as by the latter's brilliant pupil and successor, Professor d'Arsonval. Thus Rivière was perhaps the earliest advocate of the pragmatic approach to medicine. The diagnostics and therapeutics of things tangible, visible and practical were the measures that held greatest appeal to the logic of this young physician, and the specialty, *Physicothérapie,* was his choice by inclination as well as because of its renascent popularity in then European schools. This was the age when science was in its ascendency and philosophy and the arts in their finest flowering. The works and cultural interests of Rivière clearly show the impact of this era on his professional and spiritual life cycle.

By 1910, Rivière had become recognized as France's leading exponent of Physical Medicine. Up to that year, he not only had published more than 34 scientific papers that virtually encompassed every important branch of our discipline as accepted by contemporary organized medicine, but published his mature ideas and experiences in the formal manner of a textbook. His "Outline of Clinical Physical Therapy" (*Esquisses Cliniques de Physicothérapie*) was as much a departure from the traditional past as it was an affirmation of its eternal fundamentals. The major part of this volume could well stand the critical test of present day teaching, with exception of several viewpoints on electrology, which time had tarnished and antiquated, and more recent discoveries had provided new orientations.

In 1927, he visited the United States and Canada as diplomat without portfolio of France, but of greater significance, as the presiding ambassador of an international organization of 5,000 members, whose heart cried for amity and peace between nations in the interest of the distressed minorities throughout the world. The myriad of professional friends layed as heavy a claim on his time, to speak before medical societies, as on his digestive capacity to withstand the celebrations in his honor. New York feted him, Chicago honored him and the daily press of our country converted an amiable and learned man into figure of heroic disproportion.

Accordingly, our Congress, then the lusty and iconoclastic junior organization in America, regarded the honor of Rivière's visit to our annual convention in Chicago, with especial significance. It was a session rich with the scientific viewpoints of the two leading schools of practice—France and Germany, with Nagelschmidt and Rivière as its leading representatives. To both, our Congress owes an especial debt because they left us with a clearer orientation of the value of diathermy as an ameliorative agency.

Rivière had a natural quality of friendly but informal interest in his fellow men. The heart spoke through his tongue. He was the instinctive gentleman and an observer of all the amenities associated with culture. As a writer and speaker he often epitomized a complicated thought into the picturesque wisdom of an aphorism. The year before the late war there were ominous overtones in the atmosphere of Paris. By nature an optimist, Rivière reverted to pessimistic speculation on the trend of humanity and the tragedy of dis-

ease. Health and happiness, he wrote, was the desideratum of human endeavor. It wasn't the mystery of life which gave him unease, but the paradox of human behavior and the phobias of its own creation. In the light of his constant concern about his fellow men one cannot but feel that the greatness of the man, the contagion of his personality and the qualities that will endear him to posterity could be viewed through the causes to which he was attached.

What of his scientific contributions and his intellectual influence on his time and posterity? Rivière was the first to employ high frequency current in clinical medicine by an apparatus designed by d'Arsonval, and was regarded by the latter as his most beloved disciple. As Editor-in-chief of the *Journal of Physiotherapy,* the *Annals of Physiotherapy,* and member of the committee of Editors of the *Gazette Médicale de Paris* he did much to raise the consciousness of the French speaking world toward a greater appreciation of physical medicine.

The name Rivière became a by-word in our discipline decades ago for special contributions above the line of daily practice and literary contribution. Rivière's name on our Congress' roll of highest honor was due to the circumstance that he was the first to use and describe the value of high frequency current in neoplastic diseases. His paper, read before the International Congress of Electrology and Medical Radiology at Paris in July, 1900, established his priority as the first who used electrosurgery for tuberculous and malignant tumors. For this original and important contribution, our Congress accorded him the highest award within its power—the Gold Key and life membership for extraordinary service in medicine, with the accolade of "Father of Electrosurgery." How far reaching and important this single contribution has been to humanity is today attested by the rich literature that has since grown around this modality and its increasing usefulness in the field of neurosurgery, urology and cancerology. Rivière's claim to recognition by contemporary medicine is even more far reaching. He was the first to employ x-ray therapy in malignant affections and the first to use radium in similar conditions in France.

Space forbids mention of his mechanical talents in the construction of apparatus of especial value in electrology, photo- and actinotherapy, kinesiotherapy, mechanotherapy, hydrotherapy and the like. At the end of the year of 1933, Rivière presented a rich gift of archaic and early types of instruments and apparatus to the Sir Henry Wellcome Historical Museum of London, together with a life size oil painting of himself, which now forms an integral part of the collections on the progress of medicine as a section of the historic progress of physical therapy in Europe. A letter to him in 1933, from Sir Henry, informs Rivière . . . "It is an honor for me to have in my Museum the early apparatus which you employed in your work in physio-therapy and I value and appreciate your gift very highly. . . . In due course (it will) be arranged and set out in such a manner as will show the evolution of this form of treatment from its beginning, and the names of d'Arsonval and Rivière will be put on historical record. . . ." France also recognized his outstanding qualities as a citizen and scientist by awarding him on three different occasions the ribbon of the Legion of Honor, and the rosette and cravat of its higher rank. D'Arsonval said of him with affection: "Rivière was the first to enter my house of science and he made it better for having come in." This recognition by the greatest contemporary of electrophysiology could well summarize the opinion of our Congress as a final epitaph for the accomplishments of Rivière as an outstanding pioneer in physical medicine.

Disraeli Kobak, M.D.

THE COURSE IN PHYSICAL MEDICINE AND REHABILITATION AT THE UNIVERSITY OF TEXAS

The course of postgraduate instruction in physical medicine offered by the Medical School of Texas University was carried out with impressive success from March 4 to 7 at Galveston. Physicians, technicians, nurses and members of the armed forces traveled from all parts of the great State of Texas and the adjoining states to listen to a faculty of outstanding instructors. The roster of invited lecturers included Drs. Frank Krusen of Rochester, Minn. and Richard Kovács of New York, Drs. R. L. Bennett of Georgia Warm Springs, Ray K. Daily of Houston, Joseph Molner of Detroit, Howard A. Rusk of New York and also Capt. R. F. Dow of Hot Springs, Ark., Major A. B. C. Knudsen of Washington, D. C., Capt. A. M. Pruce of Atlanta and J. J. Brown, Director of Vocational Rehabilitation and J. L. Tenney of the Texas Board of Health, both of Austin. Participating members of the local medical faculty were Drs. Dechert, Eggers, Ewalt, Hansen, Harris, Herrman, Poth, Randall, Ritchie, Sako, Snodgrass and Weisz. Dr. Chauncey Lake, the brilliant Dean of the Faculty and himself a member of the Baruch Committee on Physical Medicine, was the guiding spirit of the course and the indefatigable Dr. W. A. Selle was in charge of all planning and intricate details of execution. The total number of those attending the course was 128.

All meetings were held in the spacious and well equipped amphitheater of the Outpatient Building of the University Medical School. Sessions of the first day were devoted to thermotherapy, fever therapy and light therapy; on the second day to hydrotherapy, physical medicine in institutional practice and miscellaneous topics; on the third day, to muscle testing, exercise, massage, physical medicine in general practice and the specialties; on the final day, to rehabilitation. There was ample time for questions and discussions and between sessions moving picture demonstrations on heat, massage, hydrotherapy and rehabilitation were held. At the dinner given at the beautiful Galvez Hotel the historical development of physical medicine was vividly portrayed by Dr. Kovács and the future of physical medicine was impressively presented by Dr. Krusen. By request, the same "team" also addressed luncheon meetings of the Galveston Rotary Club, and the Texas chapter of the American Physiotherapy Association.

The interest aroused in the medical profession and in the public press by this so far unique and timely course of instruction bids well for the future progress of physical medicine in Texas and the Southwest. Texan hospitality, so cordially extended to all visitors, and especially by Drs. Eggers, Leake, Randall, Selle and their charming ladies, the relaxing atmosphere along the famous Sea Wall and the soft breezes from the Gulf, made an indelible impression and their memory will serve as an added attraction when this inaugural course is to be repeated.

IMPORTANT ANNOUNCEMENT

The officers of the Midwestern Section of the Congress announce an entire evening session devoted to the subject of Physical Medicine and rehabilitation at the Hotel La Salle, Chicago, Monday, May 13th. Speakers will include Dr. Frank H. Krusen, Dr. Harold Storms, Miss Marjorie Taylor and Miss Belle Greve. A panel discussion will follow.

Medical News
(Continued from page 230)

torian Order. Then he went back to work on his ponderous four-volume *Textbook of Ophthalmology*. Sir Stewart Duke-Elder, Presbyterian minister's son who rose to become one of Britain's top eye specialists and Surgeon-Oculist to the King, had just come back from Buckingham Palace.

Award to Major Emma E. Vogel

The Surgeon General announces the award of the Legion of Merit to Major Emma E. Vogel, Director of Physical Therapists, U. S. Army. The presentation was made by the Surgeon General of the Army, Major General N. T. Kirk, at the monthly meeting of the Medical Department officers held at the Walter Reed Medical Center, Washington, D. C., on February 21, 1946.

The citation reads as follows:

"Major EMMA E. VOGEL, M-1, Medical Department Physical Therapist, Army of the United States, as Director, Physical Therapists, Office, Surgeon General, from January, 1943 to December, 1945, effectively organized the Physical Therapists' Branch, formulating policies and plans to insure the highest standards of treatment for the sick and wounded. Major Vogel's services were at all times characterized by outstanding accomplishment and unselfish devotion to duty."

Major Vogel has had a long and distinguished career in the field of Physical Therapy. During World War I she served in several Army hospitals in a civilian capacity and in 1922 she assisted in the organization of the first Medical Department Training Course in Physical Therapy at the Walter Reed General Hospital, Washington, D. C. She served as Technical Supervisor of this course until 1942.

Major Vogel was assigned as Superintendent of Physiotherapy Aides, Office of the Surgeon General, in August, 1942, which position she held until the passage of Public Law 828 on December 22, 1942, authorizing military status for this group. Following this legislation, Major Vogel was appointed as the first Director of Physical Therapists, effective January 12, 1943, in which capacity she has served with outstanding distinction to the present date.

During her service as Director of Physical Therapists, Major Vogel has organized the Physical Therapy Branch, formulated administrative policies, and assisted and advised in the preparation of Army Regulations and directives pertaining to this new military group. In addition, through her efforts and under her direction, training courses for Physical Therapists were established in nine selected Army hospitals to supply critically needed and adequately trained personnel. The number of Physical Therapists appointed grew from 289 on March 31, 1943, to approximately 1400 on V-J Day. Of this number, about 800 received either their entire professional training or completed apprenticeship in the courses in Physical Therapy offered by the U. S. Army.

During this period, Major Vogel has also acted as advisor to the Surgeon General and to various divisions of the Surgeon General's Office in matters pertaining to Physical Therapy. She has worked untiringly to maintain the highest standards of education and professional training for Physical Therapists appointed as members of the U. S. Army Medical Department. Policies and plans formulated under her guidance have been reflected in the high calibre of Physical Therapy treatment afforded to the sick and wounded in Army hospitals.

New Program on Crippling Diseases Affecting Children

A nationwide five point program to expand and accelerate its fight against all crippling diseases affecting children will be set into action at once by the Shriners of North America, it was announced in New York recently. The new program has been developed through a series of meetings sponsored by the Shriners' Imperial Council. The five phases of the new plan are:

The granting of scholarships, to be known as the Fellowships of the Shriners' Hospitals for Crippled Children, in orthopedic surgery to outstanding, qualified medical students. An initial yearly appropriation of $7,500 has been set aside. Three scholarships of $2,500 each will be made in 1946 for training in three universities, soon to be named.

An annual appropriation of $3,750, to be granted for scholarships in orthopedic nursing. These nurses, in turn, will instruct and give encouragement to other nurses interested in specializing in the crippled children's field.

The establishment of a research project to probe further the sources, methods of treatment and prevention of all crippling diseases attacking children.

The expansion of present facilities and equipment of the fifteen Shriners' hospitals now in operation and establishment of new hospitals in other localities.

The establishment of convalescent homes in connection with all Shriners' hospitals as rapidly as possible. The installation of recreational and occupational therapy courses to assure continuing physical improvement and self development after healing has been completed.

Sunlight and Carcinoma

Harold Blum, Ph.D., of the United States Public Health Laboratory of Bethesda, Maryland, conducted a special conference at the University of Texas Medical Branch, Galveston, on the "Influence of Sunlight on Carcinogenesis." Doctor Blum has recently been awarded a Guggenheim Fellowship for the study of therodynamic factors in evolution.

Research Program

At Western Reserve University School of Medicine the chair of biochemistry was left vacant recently with the appointment of Dr. Victor C. Myers as head of a new department of clinical biochemistry. Operating the two new departments, the School of Medicine will follow the British pattern of having one department of biochemistry to carry on research and give instruction in chemistry as it affects all forms of life, and another to perform a similar function as it affects more direct clinical observation and diagnosis of human illness.

Dr. Marshall New Acting Dean

The Administrative Committee of the School of Medicine at the University of Utah which formerly acted in the deanship capacity has, at its request, been dissolved. Dr. H. Leo Marshall, Professor and Head of the Department of Public Health and Preventive Medicine has been named Acting Dean.

Harry P. Wareham New Administrative Officer

The American Society for the Hard of Hearing announces the appointment of Mr. Harry P. Wareham, of Rochester, N. Y., who served in New York City as Executive Vice-President of the National War Fund as Executive Vice-President of the Society. As administrative officer he will direct the expansion program of the Society.

Fourth Congress of French-Speaking Electro-radiologist Physicians

The Fourth Congress of French speaking Electro-radiologist physicians will be held under the presidency of Doctor Delherm, from October 9 to 12, 1946, simultaneously with the Congress on Surgery.

Three reports will be discussed: 1. Critical Study of Chronic Spinal Rheumatism, by Doctor Lachapele. 2. Radiotherapy by Contact, by Messrs. Cottenot, Lamarque and Gors. 3. Possibilities and Limitations of Electro-encephalography, by Professor Baudoin and M. Fishgold.

Address all correspondence to Doctors Chérigié, 9 Rue Darue, Paris VIII.

Medicolegal Abstracts

Osteopaths: Rights Under E. M. I. C. Program. —An act of Congress, chapter 221, Public Law 135, known as "Labor-Federal Security Appropriations Act, 1944" under the subtitle "Maternal and Child Welfare" provided for the grant of money to states for emergency maternity and infant care for the wives and infants of certain enlisted men and aviation cadets in the armed forces of the United States. The use of federal funds received by any state was made subject to the following restrictions:

". . . Provided, That no part of any appropriation contained in this title shall be used to promulgate or carry out any instruction, order or regulation relating to the care of obstetrical cases which discriminates between persons licensed under state law to practice obstetrics: Provided, further, That the foregoing proviso shall not be so construed as to prevent any patient from having the services of any practitioner of her own choice, paid for out of this fund, so long as state laws are complied with."

In both Wisconsin and Texas the plans submitted by the state board of health and subsequently approved by the Children's Bureau eliminated osteopaths from receiving payment for services out of funds made available for the E. M. I. C. program by requiring that the physicians furnishing the services be graduates of a medical school approved by the Council on Medical Education and Hospitals of the American Medical Association. In Wisconsin the osteopaths protested by filing an action asking for a declaratory judgment as to the validity of the state plan. From an order overruling the defendants' demurrer, the state board of health appealed to the Supreme Court of Wisconsin. In Texas, a few months later, the osteopaths filed suit for an injunction to restrain the state board of health from operating under its plan until it had been so amended as to permit osteopaths to participate. From a judgment for the plaintiffs, the defendant appealed to the court of civil appeals, Austin, Texas.

In Wisconsin the state board of health demurred on the ground that the complaint did not state a proper case of declaratory relief. The Supreme Court said that the allegations were:

"Solely concerned with the proper distribution of federal funds by a federal administrative board, through the Wisconsin state board of health acting as its agent. The several appropriations made by Congress to carry out the E. M. I. C. program were all made to the United States Department of Labor, Children's Bureau, which bureau allots the funds to the several states to carry out the program according to plans approved by the federal bureau. That puts this controversy out of our reach. No facts are alleged in the complaint to the effect that any osteopath has been deprived of the right to practice obstetrics or that any such action has been threatened. Neither is any declaration demanded along this direction. The pleadings, therefore, state no cause of action for declaratory relief on this point. . . . Accordingly the judgment in favor of the osteopaths was reversed and an order entered sustaining the defendant's demurrer."

In Texas the state board of health contended that the state courts lost jurisdiction of this case because of the rule that

"In the absence of Congressional sanction, state courts cannot entertain suits against the United States or its agencies, including corporations created by the national government, and are with-

out jurisdiction to control or restrain the official conduction of federal officers or agents, federal courts having exclusive jurisdiction over such suits. (21 C. J. S. 796.)"

This appropriation act, said the court of appeals of Texas, does not sanction or authorize state courts to entertain suits with respect to any matter arising thereunder. Under such appropriation act the members of the state board of health are not acting as state officials but merely as the agency of the federal government through which the appropriation is to be expended. The act does not authorize the members of the state board of health to receive or administer any portion of the funds appropriated and allotted to Texas, the court continued, except under a plan approved by the chief of the Children's Bureau. The record in this case showed that the Children's Bureau in fact outlined the plan for the administration of the fund allotted to Texas and approved such plan as required by the act. Neither the act nor any Texas statues undertake to authorize the members of the board of health to act in any manner except as an agency of the federal government in administering the federal fund appropriated by the Congress to aid in the care of wives and infants of certain enlisted men. The court then quoted with approval the statement quoted from the Wisconsin decision and in reference to such quotation said that

"The foregoing quotation from the Hecker case overruled the contention of appellees that the Congress, under the appropriation act in question leaves the development and setting up of the plan for the disbursement of the funds wholly to the state health agencies. The Act provides that the state health agencies must adopt rules for the distribution of the funds, and who may participate in care of the wives and infants of soldiers and aviators, but expressly provides that such rules and plans must be approved by the Children's Bureau at Washington; and, as was said in the Hecker case, "it was the approval of the plan by the federal bureau that gave the E. M. I. C. program its vitality."

Accordingly the judgment in favor of the osteopaths was reversed and the injunction dissolved.—*Hecker v. Gunderson, 15 N. W. (2d) 788 (Wis., 1944); State Board of Health v. Wilson, 188 S. W. (2d) 999 (Texas, 1945).*—[Reprinted, J. A. M. A. 130:371 (Feb. 9) 1946.]

Louisiana State

Dr. William E. Smith, who assumed the deanship, professor and head of the department of anatomy at Louisiana State University School of Medicine has resigned all these positions.

Athletics in Sweden

The critical attitude of Swedish physicians has been evidenced in one of the greatest popular movements, athletics. Because the physicians have refused to maintain that sports prolong life or protect from illness they have been accused of obstructing the progress of sports and of indifference to improving the health of the public. The result has been the development of quackery in connection with the physiology of athletics, training methods, diet and so on. Last year saw the development of closer cooperation between physicians and the sports movement, and far less indifference in Sweden.

Medical Science and Industry

Section N of the American Association for the Advancement of Science devoted its meeting in St. Louis, March 27 to 30, to a symposium on medical science and industry. It is organized in cooperation with the Council on Industrial Health of the American Medical Association. Among those who took part in the program were: Dr. Alfred P. Solomon, Chicago, "Traumatic Neuroses in Industry"; Dr. Robert Elman, St. Louis, "Recovery and Convalescence as Related to Traumatic Injury," and Dr. Thomas H. D. Storms, Toronto, Canada, "Functional Rehabilitation."

Use of Hospital Ships for Veterans Proposed

Until the hospital program of the Veterans Administration provides more beds, floating hospital ships are the answer to the acute shortage of facilities for veterans, according to Senator Mead, Democrat of New York. He said that both the Army and the Navy have excess hospital ships which could be used. Some ships are now being used to transport war brides to this country. War Secretary Patterson authorized General Omar N. Bradley to announce that army engineers will take over the bulk of construction on the agency's $448,000,000 "skyscraper" gigantic hospital building program. Bradley described it as "the most gigantic hospital building program in the history of the world" and estimated that with the help of the engineers the hospitals could be completed in eighteen months to two years. Veterans are to have 183 permanent hospitals with a capacity of 151,500 beds. General Bradley also proposes a nationwide system of home town medical and hospital care for disabilities traceable to military service.

Winford Smith Leaves Johns Hopkins Hospital

Dr. Winford H. Smith, since 1911 director of Johns Hopkins Hospital, Baltimore, has announced his retirement, effective March 31. Dr. Edwin L. Crosby, Jr., assistant director since 1940, has been named to succeed Dr. Smith.

Spa Water Used in Therapy of Rheumatic Disease

A long term experiment on treatment of chronic rheumatic ailments at the Saratoga Spa was inaugurated January 16 by Dr. Walter S. McClellan, Saratoga Springs, medical director. A group of patients with various rheumatic conditions will receive a series of treatments involving use of natural spa mineral water and water fortified with additional radioactive substances. The Saratoga Spa is owned by the state.

A New Treatment of Lupus Vulgaris

At the section of dermatology of the Royal Society of Medicine Drs. G. B. Dowling and W. P. Thomas reported remarkable results from the treatment of lupus vulgaris with large doses of calciferol. They had treated 38 cases, of which 16 have been followed for more than a year. In all improvement was observed and in 12 the lesions seem to have disappeared entirely. In 1 there has been no return of the disease in the eighteen months since the treatment was stopped. A few have shown little benefit, but the majority have been strikingly improved after making poor progress under other treatment. The dermatologists who saw some of the cases were much impressed. This new treatment is far simpler and much less expensive in time and effort than current methods, such as frequent exposures to Finsen light or ultraviolet rays. But the treatment has the disadvantage of requiring doses which border on the toxic. At least 8 patients have shown signs of intolerance, such as nausea, loss of appetite and depression. Most of these received 150,000 international units of calciferol daily. In all of these the toxic symptoms disappeared when the dosage was reduced to 100,000. Unlike the natural vitamin D obtained from fish liver oils, calciferol is prepared artificially by irradiation of a vegetable sterol, ergosterol, and the preparations may include toxic by-products of irradiation. Very large doses are known to cause deposition of calcium in soft tissues, notably the renal tubules and arterioles and the media of large blood vessels. Though this calcification tends to disappear on discontinuance of the calciferol, it should not be used on the scale employed by Dowling and Thomas without careful consideration of the case and watching for toxic symptoms.

Brigadier General William C. Menninger Awarded Distinguished Service Medal

Brigadier General William C. Menninger, Director of the Neuropsychiatry Consultants Division, Office of The Surgeon General, has been awarded the Distinguished Service Medal for the primary responsibility of "solving one of the most serious medical problems faced by the Army" in developing and putting into effect a treatment plan for neuropsychiatric cases, according to an announcement by the Office of The Surgeon General.

Stockton Kimball Named Acting Dean at Buffalo

Dr. Stockton Kimball, Buffalo, has been appointed acting dean of the University of Buffalo School of Medicine. He was appointed instructor in medicine and pharmacology in the medical school in 1935, later promoted to associate and in July, 1944 made assistant dean. Dr. Edward W. Koch, dean for sixteen years, died February 9.

Brigadier General George C. Beach New Commandant at Army Medical Center

Brigadier General George C. Beach, since 1942 the Commanding General of Brooke Hospital Center, Fort Sam Houston, Texas, has assumed command of the Army Medical Center, Washington, D. C., succeeding Major Shelley U. Marietta, who is retiring from active service.

Colonel McEwen Returns as Dean

Col. Currier McEwen, after more than two and a half years of military service, has resumed his duties as dean of the New York University College of Medicine. Granted a leave of absence by the university for military service, he entered active military duty May 6, 1943 and returned with the Bronze Star and the Legion of Merit.

Dr. Lapham Returns as Dean

On January 1 Dr. Maxwell E. Lapham returned to his position as dean of Tulane University of Louisiana School of Medicine, New Orleans. Dr. Lapham had been in service with the navy.

Funds Asked to Modernize Bureau of Standards

President Truman has asked Congress for a million dollars to modernize the National Bureau of Standards. Acting Budget Director Paul H. Appleby said the present plant is in such bad repair that testing and research work cannot be conducted efficiently.

Arthritis Research Foundation Formed

Establishment of a National Arthritis Research Foundation was announced in Chicago recently. A campaign for $2,500,000 will be launched to set up the foundation as a national and independent center for studying the cause and treatment of rheumatic diseases. The main building will be located in Hot Springs National Park. The creation of the foundation stemmed from the plan of the Leo N. Levi Memorial Hospital, Hot Springs, Ark., to develop a research wing.

Negro Doctors to Serve in Veterans' Hospitals

Dr. Paul R. Hawley, Veterans Administration medical director, reports that the way has been cleared for appointment of Negro doctors in veterans' hospitals, with local custom to be the ruling factor in appointments. He is considering plans to set up all Negro units in a number of hospitals with Negro patients to be attended by Negro doctors and nurses. Dr. Hawley reports that 152 full time resident physicians are now on duty in eight veterans' hospitals. The House Military Affairs Committee has voted favorably on a bill to permit retired officers to work as physicians, executives and hospital managers for the Veterans Administration without affecting their retired status.

Misbranded Products *

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency.

[Editorial Note. — These Notices of Judgment are issued under the Food, Drug and Cosmetic Act, and in cases in which they refer to drugs and devices they are designated D.D.N.J. and foods, F.N.J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the reason for the charge of misbranding, and (6) the date of issuance of the Notice of Judgment.]

R & R Ultra Violet Ray and Radiation Machine. — Lawndale Laboratories, Lawndale, Calif. Shipped June 29, 1942. A high voltage mercury vapor discharge tube. Misbranded because of these label misrepresentations, among others: that the device would cure or prevent arthritis, acne, asthma, gout, jaundice, carbuncles, anemia, goiter, deafness, erysipelas, locomotor ataxia, psoriasis, female trouble and many other disorders; and that it would give off ultra violet rays of adequate intensity to produce in the body vitamin D in an amount sufficient to compensate in an important respect for the deficiency of vitamin D resulting from indoor occupations and unfavorable climatic conditions, whereas the device would produce ultra violet rays of only weak intensity and supply little, if any, vitamin D to the body. — [*D. D. N. J., F. D. 981; November, 1944.*]

Vitaminerals. — Vitaminerals Company, Los Angeles. Shipped between May 5 and 27, 1942. Consignment comprised quantities of Vitaminerals VM 1, 1+, 100 and 120. The first two contained various plant materials, the third, minerals, and the fourth, sulfates of iron and aluminum, with glycerin and water. Misbranded because of label misrepresentations: that No. 1 would help arthritis, colds, hemorrhoids, neuralgia, neurosis, obesity and tonsillitis; No. 1+, most of the same disorders and a few more; No. 100, female complaints, and No. 120, colonic, ear and throat troubles, anemia, asthma and many other conditions. — [*D. D. N. J., F. D. C. 946; October, 1944.*] Under *D. D. N. J. 1041*, issued in March, 1945, Vitaminerals VM Nos. 1, 100, 120 and 150 and 204 Pneumatic Dilator (a device sold for rectal disorders) were declared misbranded because of label misrepresentation.

* Reprinted J. A. M. A. 130:814 (March 23) 1946.

A Residential Rehabilitation Center

A residential rehabilitation center for those injured in the war or in industry has been set up at Egham. Employers, trade unions and orthopedic surgeons are convinced that severe disablement and convalescence must be followed by a gradual approach to ordinary employment. The center can accommodate 230 men during courses lasting six to eight weeks who are gradually acclimatized to working conditions by gaining confidence in the manipulation of artificial limbs or overcoming other physical and mental handicaps. Of 1,000 men who have passed through this center, about 500 have returned to former jobs or other suitable occupations.

Course for Physical Therapy Technicians

The section on physical medicine of the Mayo Clinic, Rochester, plans to offer noncredit three months graduate or refresher courses, beginning July 1. The course will be offered without tuition and will be limited to twenty students, who will be taken only from regular courses for physical therapy technicians which have been approved by the Council on Medical Education and Hospitals of the American Medical Association. A second graduate course is planned to start October 1. These refresher courses are intended to supplant the regular emergency course for the training of physical therapy technicians, which will be discontinued July 1, when the present class completes its training.

Hospitals Cooperate in Plans for Medical Center

The New Jersey Orthopaedic and Orange Memorial Hospitals, Orange, will be consolidated in a plan to establish a medical center serving the whole northern New Jersey area. The present New Jersey Orthopaedic building will then be converted into a hospital for convalescent patients, filling a long felt need for the entire northern New Jersey territory. The new convalescent hospital will operate as a separate agency, and the Memorial and Orthopaedic hospitals will retain separate identities, though they will occupy adjacent buildings and work closely together.

Abstract of Notice of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

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Mennen Antiseptic Oil. — Mennen Company, Newark, N. J. Shipped Feb. 16, 1942. Composition: a yellow, perfumed, saponifiable oil containing small amounts of hydroxyquinoline, chlorobutanol, hydroquinone and benzoic acid. Misbranded because of these false and misleading label claims, among others: "It has equal antiseptic and germicidal powers to the commonly used ammoniated mercury ointments. . . . Meets the widespread demand of hospitals, physicians, nurses and mothers . . . offers protection against infection. — [*D. D. N. J., F. D. C. 926; October, 1944.*] [Rep. J. A. M. A. 130:734 (Mar. 16) 1946.]

BOOK REVIEWS

THE PHYSIOLOGICAL BASIS OF MEDICAL PRACTICE. A UNIVERSITY OF TORONTO TEXT IN APPLIED PHYSIOLOGY. By *Charles Herbert Best*, C.B.E., M.A., M.D., D.Sc. (Lond.), F. R. S., F. R. C. P. (Canada); Professor and Head of Department of Physiology, Director of the Banting-Best Department of Medical Research, University of Toronto; and *Norman Burke Taylor*, V.D., M.D., F.R.S. (Canada), F.R.C.P. (Lond.), Professor of Physiology, University of Toronto. Fourth Edition. Cloth. Price, $10.00. Pp. 1182, with 500 illustrations. Baltimore: The Williams & Wilkins Company, 1945.

The fourth edition of this well known book appears in a new form. It is entirely reset in a large double column format that reduces the bulk of the book, speeds up reading because more of the subject is before the eyes at the moment and the reader's mind is less distracted by the turning of pages. The majority of the figures have been reduced to one column width thus permitting a further saving of space with little, if any, loss of clearness.

The ultimate interest of medical students is the diagnosis and treatment of disease. Physiology can emphasize those aspects of the subject which will throw light on disorders of function. The student and practitioner is thus given a vantage point from which he may gain a rational view of pathologic processes.

This book gives the student and physician, regardless of specialty just what the title promises: the physiologic basis of medical practice. It links the laboratory and clinic. It serves to promote continuity of physiologic teaching throughout the pre-clinical and clinical years of the undergraduate course.

Many physiologic problems can be approached only through annual experimentation. On the other hand many problems can be elucidated only by observation on man and physiology has gained much from clinical research. Within recent years the clinical physiologist, fully realizing these advantages and the opportunities afforded by the hospital wards has contributed largely to physiologic knowledge. In many instances clinical research has not only revealed the true nature of the underlying process in disease, but has cast a light into some dark corner of physiology as well.

In the last century, knowledge of the processes of disease was sought mainly in the studies of morbid anatomy. Biochemistry was in its infancy and many of the procedures now commonly employed for the investigation of the human subject had not been devised. Today, the student of scientific medicine is directing his attention more and more to the study of morbid physiology in his efforts to solve clinical problems. It has the beneficial result of drawing the clinic, and physiologic and biochemical laboratories onto common ground from which it has often been possible to launch a joint attack on disease. In this book this trend is shown and greater prominence to the clinical aspects of the subject is given than is usual in physiologic texts.

In order to understand the function of an organ it is usually essential to have a knowledge of its structure. Therefore preceding the account of the physiology of a part there is a short description of its morphology and in many instances an account of its nerve and blood supply. The architecture and functions of the central nervous system are so intimately related that some space has been devoted to a description of the more important fiber tracts and gray masses of the cerebrum, cerebellum and spinal cord.

Four editions, fourteen printings and Spanish and Portuguese editions since 1937 are evidence of the unparalled popularity of this book. The volume is highly recommended to help one keep abreast of the rapidly moving facts and theories of applied physiology. It is comprehensive. It is applicable in daily practice to show how physiologic principles can aid in the bedside management of disease.

REPORT OF THE NATIONAL HEALTH SERVICES COMMISSION ON THE PROVISION OF AN ORGANIZED NATIONAL HEALTH SERVICE FOR ALL SECTIONS OF THE PEOPLE OF THE UNION OF SOUTH AFRICA, 1942-1944. Published by Authority. Paper. Pp. 219. Price, 10s. 6d. Printed in the Union of South Africa by the Government Printer, Pretoria, 1944.

This unique and very timely document reports on the results of a survey into the health services of the Union of South Africa and recommendations based on it for the organization of a national health service. South Africa, with its sparsely-populated rural areas and its congested Native Territories, has its own peculiar problems which require special consideration. There has been a continual demand in the daily press as well as in the scientific, professional and technical journals during the past twenty and more years for the appointment of a Commission to investigate and report on the weaknesses in the health machinery of the country. Such a commission was finally appointed in February, 1942. The Commission decided that they could not address themselves with confidence to their task without acquainting themselves at first hand with the varied conditions existing in different parts of the vast area of the Union. Accordingly, a tour lasting three and a half months was made. Almost all of the public authorities, voluntary organizations

and individual witnesses who appeared before the Commission had prepared written memoranda. The oral evidence furnished by over 1,000 witnesses was recorded and amounted to approxmately 3,500,000 words. Copies of the memoranda numbering 505 have been with the records of oral evidence. Carefully-framed questionnaires prepared by the Commission were addressed to local authorities, general hospitals, mission hospitals, and doctors, dentists, nurses and health inspectors serving with the South African Medical Corps. There has thus become available and been recorded the results of a comprehensive inquiry into the economic, physical and mental factors in connection with the nation's human resources. The final report of the Commission states that an organized National Health Service implies a national health authority. This in turn implies the assumption by the State—for there can be no other national authority—of ultimate legislative and financial responsibility for the provision of health services for all, on a basis of need instead of means. The Commission proposes that the National Health Service should be completely responsible executively for those health services—preventive and curative personal health services—which require for their carrying out the services of medical, dental and nursing personnel. In this way it will be possible, particularly in a country which is short of such personnel, and presents great socio-economic variations, to make the most efficient use of all the resources of health personnel and matterials available. The proposal is that all extra-institutional medical practice in future should be based upon Health Centers, each serving the population within a clearly defined area. General practitioners will there be supplied with adequate technical diagnostic equipment and will be assisted by nurses, radiographers, laboratory technicians, physiotherapists, etc. The general practitioners in a Health Center area will form a team, electing its own leader and its own representatives to the Health Center Council. In regard to health promotive services—wage determinations, general and health education, physical education, nutrition, industrial hygiene and welfare—the National Health Service should not itself be executive, except to carry out, in collaboration with appropriate authorities, pure and applied research on the medical aspects of such services, to have advisory and inspectoral functions with regard to them, and to assist in certain aspects of health education and industrial hygiene. In regard to non-personal health services—housing and town-planning, sanitary measures, food handling, the abatement of nuisances, the regulation of noxious trades—the National Health Service should have advisory, inspectoral and, where necessary, coercive powers. It should also collaborate with appropriate authorities in research related to those services. The Commission estimates that the cost of the National Health Service would at first not be very much greater than the amount now being spent on ill health. The amount to be spent will be determined by the personnel available; and it would take several years before the plans for increased production of personnel would become fully effective. Nevertheless, the better distribution of personnel, and the complete rationalization of services, by placing them under unified control, would result in much greater efficiency for little extra expenditure. In addition to the statutory contributions under the Workman's Compensation Act and the native Labor Regulation Act, it is proposed that there should be a Health Tax levied on all income groups. All will be expected to make a contribution, no matter how small, even if only a token, so that the people will feel it is their health service. The Commission asserts that they had evidence up and down the land that the people are thoroughly dissatisfied with the inadequacy and incoordination of health and medical services, and that they want—nay, demand—a fully-planned National Health Service; their need is desperate; and in order to satisfy it they will be prepared to meet additional taxation, and, if necessary, to support far-reaching administrative changes. This is a highly interesting report in view of the present agitation for a similar national health service in the United States with its vastly different social, political and economic organization.

WILLIS RODNEY WHITNEY PIONEER OF INDUSTRIAL RESEARCH. By *John T. Broderick*. With foreword by Dr. *Karl T. Compton*. Second Edition. Cloth. Pp. 324 with illustrations. Price, $3.00. Albany, N. Y.: Fort Orange Press, Inc., 1946.

This is the story of the life of the man who has largely set the pattern and philosophy of the modern industrial research laboratories, one of the unique achievements of this century. Every "unexplained" phenomenon aroused his curiosity and was likely to become the subject of his scientific observation and experimentation. As a physical chemist in Leipzig and at the Massachusetts Institute of Technology, Whitney made important discoveries of the properties of colloids and laws governing their stability, particularly in relation to electrolytes. Thence suspensions and emulsions engaged his attention especially the influence of ions and their valence and migration rate on coagulation. But his major achievements were made as director of the Research Laboratory of the General Electric Company.

Compton in his foreword gives the key to Whitney's fame. "Whitney's attitude toward research is, I think his greatest contribution, because he has inspired thousands of others with the same attitude, both among fellow scientists and on boards of directors. He quotes King Solomon: 'It is the glory of God to conceal a thing, but the glory of a king to search it out.'"

His modesty is shown in his own words: "I fancy there is little in my career to warrant a book, and even if there were much I'm not sure that I could readily warm up to the theme. To dwell upon myself, as I would be expected to do in order to supply a biographer with some of the material that he would need, would take my thoughts away from something more worthwhile

and of greater interest—from Nature's spacious storehouse which contains so much that we cannot yet appraise or even understand."

Broderick shows that Whitney is original and constructive. The House of Magic, a name popularized on the radio by Floyd Gibbons for the General Electric Research Laboratory at Schenectady is an expression of him, not only as to its inanimate parts, bricks, mortar, steel and the paraphernalia of research, but more significantly as to the five hundred highly skilled men and women who make of it a hive of study, speculation and discovery. This is a biography of an interesting man told in an interesting and readable book. It is recommended as an inspiration to those engaged in any kind of research.

NOTABLE NAMES IN MEDICINE AND SURGERY. By *Hamilton Bailey,* F. R. C. S. (Eng.); F. I. C. S., Surgeon Royal Northern Hospital, London; and *W. J. Bishop,* F. L. A., Sub-Librarian, Royal Society of Medicine. Second Edition. Cloth. Pp. 202 with 238 illustrations. Price, 15s. London: H. K. Lewis & Co., Ltd., 1946.

This interesting little book gives the portraits and short biographies of some of those whose discoveries, while not necessarily the greatest medical discoveries, have become eponymous in the medical and allied professions. In addition there are numerous illustrations of the discoveries and the hospitals where the various physicians worked.

Many of the notable names are of interest to those in physical medicine. Colles' Fracture and Abraham Colles (1773-1843) became a household word in surgery following his paper on this fracture in 1814. Bell's Palsy was described by Charles Bell (1774-1842) in the Transactions of the Royal Society in 1821. Dupuytren's Contracture was named after Baron Guillaume Dupuytren (1778-1835). His rise from poverty to be the leading surgeon of France, a baron of the Empire and a millionaire is an enthralling story. Syme's Amputation was reported by James Syme in 1844. His contemporaries said that he never wasted a word, a drop of ink or a drop of blood.

Volkmann's Ischaemic Contracture was described by Richard von Volkmann (1830-1889) in 1881. The whole of his professional life was spent at Halle in Saxony. When only 26 years old he was appointed to act as deputy professor of the Surgical Clinic at Halle and in 1867 he became the professor. Erb's Palsy was described by Wilhelm Heinrich Erb (1840-1921) in 1874. He introduced the method of electrodiagnosis by galvanic and induction currents and was a pioneer in the field of electrotherapy.

Lorenz Boehler is Director of Unfallkrankenhaus, Vienna. The hospital was founded in 1924 and is maintained by insurance companies, which are, of course, primarily interested in rehabilitating their insured with the least possible permanent disability. The Unfallkrankenhaus in Vienna was the first hospital to be run on these lines. Farsighted directors of insurance companies saw that by segregating accident cases, particularly fractures in institutions with special equipment and staffed by surgeons with special experience in these cases in the long run economy would be effected. The experiment was an unqualified success. Boehler's famous book "The Treatment of Fractures" was first published in German in 1929.

Besides there are many notable names of general interest. The formula for Dover's Powder was given in 1732 by Thomas Dover (1660-1742) in his book "The Ancient Physician's Legacy to His Country." The story of Dover reads like one of Smolleth's novels. In 1708, he became a partner in a pirateering expedition to the South Seas. The most noted event of the expedition took place in 1709 when Dover rescued from an island off the coast of Chile, a Scottish sailor named Alexander Selkirk who had lived there alone for over four years. Captain Rogers, the commander, published a full account of the voyage in a book entitled "A Cruising Voyage Round the World," and it was on the story of Alexander Selkirk as related therein that Daniel Defoe based the immortal story of Robinson Crusoe. So it is hard to decide who is the more worthy of immortality, the physician who gave us the powder or the pirate who gave us Robinson Crusoe.

AN EXPERIMENT IN THE PSYCHIATRIC TREATMENT OF PROMISCUOUS GIRLS. A psychiatric study under the auspices of the Venereal Disease Division of the United States Public Health Service, the California State Department of Public Health and the San Francisco Department of Public Health. January, 1943 to June, 1944. By *Ernest G. Lion,* M.D., Director; *Helen M. Jambor,* Chief Psychiatric Social Worker; *Hazle G. Corrigan,* Assistant Psychiatric Social Worker, and *Katherine P. Bradway,* Ph. D., Psychologist, Psychiatric Service. Paper. No charge. Pp. 68. San Francisco: San Francisco City Clinic, City and County of San Francisco, Department of Public Health, 1945.

This leaflet is an interesting report on a project stimulated by World War II. The hindrance to the war effort through the loss of both military and civilian man-hours as a result of venereal disease has been alarming. In an attempt to seize on every method of stemming the tide of venereal diseases, public health officials suggested experimenting with the use of psychiatric facilities in the treatment of promiscuity. The experiment conducted by the workers of the psychiatric division demonstrated that much of the sexual behaviour of promiscuous girls represent an effort to substitute, for more appropriate responses, sexual activity as a solution of emotional problems not related directly to sex needs or sex expression. The San Francisco experiment has provided valuable data for a theoretical explanation of the motivation of promiscuity, and useful clues as to personal and environmental influences underlying those motivations; it has also demonstrated that promiscuity of carefully selected pa-

tients may be decreased, modified or eliminated by psychiatric treatment. The experiment reaffirms the validity of the principle of treating the patient as well as the disease. Such treatment appears now as an effective preventative measure to reduce the spread of venereal disease and mental hygiene becomes a potentially important measure to reduce promiscuity even before venereal disease infection enters the picture. As a result of the study, it is also recommended that a comprehensive and continuous program to bring adequate factual information about sex to children and young people should be encouraged. Such instruction should be started early and geared to the individual's age and understanding.

GOVERNMENT IN PUBLIC HEALTH. By *Harry S. Mustard,* B.S., M.D., LL.D., DeLamar, Professor of Public Health Practice and Director, School of Public Health, Faculty of Medicine, Columbia University, New York. Studies of the New York Academy of Medicine, Committee on Medicine and the Changing Order. Cloth. Price, $1.50. Pp. 219 with 3 illustrations. New York: The Commonwealth Fund; London: Oxford University Press, 1945.

This is a study published under the auspices of the New York Academy of Medicine Committee on Medicine and the Changing Order. It depicts the development of public health service in the United States, tracing its development from social and governmental standpoints rather than from the technical side. In the four principal chapters: Federal health services, State health departments, Local health departments, Activities of government in a public health program, the author shows how public health activity originated as a local responsibility, how state and federal governments have taken an increasing interest in it and how, though health service must be administered largely at the local level, the trend is toward greater federal assistance and indirect control. Dr. Mustard's volume sheds light on the confusing and complex relationships of federal, state and local health services and should serve as a concise guide to the numerous ramifications of government in public health and as to probable trends in the near future.

ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR 1944, WITH THE COMMENTS THAT HAVE APPEARED IN THE JOURNAL. Cloth. Price, $1.00. Pp. 238, with 50 illustrations. Chicago: American Medical Association, 1945.

This volume contains reports adopted by the Council on Pharmacy and Chemistry. There are five reports on the omission of products from New and Nonofficial Remedies, mainly for the reason that they have outlived their usefulness, and in most cases the manufacturers have expressed their lack of desire for continued inclusion of their brands. These reports are Erysipelas Streptococcus Antitoxin and Antierysipelas Serum Omitted from New and Nonofficial Remedies; Ichthammol Preparations, Isarol, Ichthynat, Ichthyol, Omitted from New and Nonofficial Remedies, and Soluble Ichthammol Not Within the Scope of New and Nonofficial Remedies; Iodine Compounds Iodalbin and Stearodine, Iodo-Casein, Iothion and Iodostarine Omitted from New and Nonofficial Remedies; Mercuric Oxycyanide, Mercuric Salicylate and Mercuric Succinimide Omitted from New and Nonofficial Remedies; and Status of Antimeningococcic Serum and Meningococcus Antitoxin.

Although this book contains little or nothing about physical medicine per se, it does contain information on medical subjects of general interest to the physiatrist, pharmacist and the pharmaceutical manufacturer. The reports concern deliberations of the Council on general subjects ranging from the use of the electron microscope to the appraisal of new drugs. The report on Pathogenic, Bacteria, Rickettsias and Viruses as Shown by the Electron Microscope is noteworthy as being pioneer work in this field. The report on the Current Status of Prophylaxis by Hemophilus Pertussis Vaccine was prefatory to the acceptance by the Council on various brands of pertussis vaccines and pertussis vaccine combinations. The valuable and highly informative article on Local Treatment of Thermal Cutaneous Burns reviews the work in this field.

DR. W. C. RONTGEN. By *Otto Glasser,* Cleveland Clinic Foundation, Cleveland. Cloth. Price, $4.50. Pp. 169, with illustrations. Springfield, Ill.: Charles C. Thomas, 1945.

This biography was published on the fiftieth anniversary of the discovery of x-rays and on the hundredth anniversary of the birth of William C. Rontgen. The discovery of the release of the energy within the atom owes its impetus, if not its origin, to the work of Rontgen and to that of Becquerel one year later regarding the discovery of radiation given out by uranium at ordinary temperatures.

In 142 pages, this book relates the life story of Dr. Rontgen from his birth to his death (1923). The book is divided into nine chapters dealing with his youth, adolescence and adult periods of life. Special attention is given to his productive scientific years. In the volume, one can view the facsimile of the original manuscript describing a "new" ray; a reproduction of the pages of the original journal article in German; his birth certificate, notice of death and other important documents.

Those physicians who have had difficulty in college with the subject of physics might be compensated in knowing that Nobel Prize winner Rontgen failed to pass his entrance examination for college.

The story of Rontgen's life is written in an interesting manner and is an excellent addition to the library containing biographies of great men.

THE ADJUSTMENT OF THE NERVOUS VETERAN IN INDUSTRY. By *Meyer Brown*, M.D., Ph.D. Paper. Pp. 52, with 4 illustrations. Chicago: Zurich Insurance Companies, Industrial Welfare Department, (n. d.).

While the content is chiefly written from the viewpoint of the adjustment of the nervous veteran, it is equally pertinent for those who have been and are civilians in industry. Those who must shoulder the great responsibility of the placement and handling of returning nervous veterans and other workers will find this publication a helpful guide. The author has refrained from the use of medical terminology and references. The table of contents consists of seven chapters, introduction, general remarks on nervous and mental disorders, psychoneurosis, psychoses, personality disorders, mental deficiencies, some problems presented by the nervous veteran and what can management do about the nervous veteran. It is interesting to note that one-third of all the men and women discharged from the Armed Forces for medical reasons are discharged for a nervous or mental disorder. In view of the fact that all but a very small percentage of these nervous veterans are able to and must work for a livelihood, industry is vitally concerned with their working ability. Many case histories are presented. Written by a competent psychiatrist who has had long practical experience in the Navy, the problems of the interpersonal adjustments of management and veteran labor are discussed. This is a book that is highly recommended.

THE PHYSICIAN'S BUSINESS. Practical and Economic Aspects of Medicine. By *George D. Wolf*, M.D., Assistant Clinical Professor of Otolaryngology, New York Medical College, New York; Fellow, New York Academy of Medicine; Fellow, American Medical Association, etc. Foreword by *Harold Rypins*, A.B., M.D., F.A.C.P. Second Edition. Pp. 433, with 58 illustrations. Cloth. Price, $6.00. Philadelphia, London, Montreal: J. B. Lippincott Company.

Professional skill and learning are the sine qua none of professional success, but the knowledge how to exercise that learning and skill under conditions most satisfactory to the physician and his patient in their human and business relationships is equally a factor. Wolf's book analyzes the practice of medicine as a business and endeavors to present the non-professional problems confronting every professional man in a sound and practical manner. It starts with short chapters on hospital internship, on medical careers other than private practice and on specialization; these chapters written for the original first edition in 1938, still refer to conditions following World War I, and could have been considerably improved in reference to greatly changed present day conditions. The chapters on professional contacts, the doctor and his patient contain much valuable data, especially practical ones as to instructions to patients. The chapters on planning and equipping an office, on office personnel, technics and surgical instruments, appear to be equally comprehensive. There is much excellent advice in the chapter on forensic medicine and on insurance. Chapters on current trends in medical practice, on prepayment health insurance and on workmen's compensation laws have been fully brought up to date. There can be no question about it that "The Physician's Business" presents an adequate discussion of the practical and economic matters which every physician encounters in his daily practice and therefore feels a definite need in the literature of medical practice.

HOWELL'S TEXTBOOK OF PHYSIOLOGY. Edited by *John F. Fulton*, M.D., Sterling Professor of Physiology, Yale University School of Medicine. Fifteenth Edition. Pp. 1304, with 507 illustrations. Price, $8.00. Philadelphia: W. B. Saunders Company, 1946.

This new edition of the well known Howell's Textbook of Physiology is thoroughly revised and in many parts completely rewritten. There is an impressive list of contributors, authorities in their particular fields of physiology. These men have taken over entire sections and written up-to-date monographs in many instances. Of particular interest to specialists in Physical Medicine is the section on principles of nervous and muscular activity by David P. C. Lloyd. The chapters on the motor functions of the central nervous system by John F. Fulton are excellent as would be expected by those familiar with his own text. The section on the cardiovascular system, also of special interest to readers of this journal, is highly recommended. Physiologic effects of physical agents, however, are not dealt with in a manner suitable to aid the student physical therapist. For example, one cannot look up with satisfaction the effects of massage, ultraviolet, high and low frequency electrical currents, or even the familiar applications of heat and cold. In spite of these defects from the point of view of physiatrics the book is recommended as a text for medical students and as an excellent reference source for the average physician.

PHYSICAL MEDICINE ABSTRACTS

Recent Significant Trends in the Care of Cerebral Palsy. Winthrop M. Phelps.
South. M. J. 39:138 (Feb.) 1946.

From all of the types of care which have been given thus far, definite indications of what is needed for these cases have been developed. These can be briefly recapitulated. The six cases each year in every 100,000 of population are classified as total cases 7 per year of which 1 dies under six years old; 6 are permanent case loads and 2 are feeble minded.

Of the group of four mentally normal cases (per year in every 100,000 population) one is severe and home or institution bound. This case, although mentally normal, is too severe ever to be made capable of self-help or self-support and needs custodial care and education because of his normal mind. There are no proper facilities for these cases at present. It is very difficult to say what becomes of many of them.

The second group, the two of moderate degree, should have everything that can possibly be provided for them both in physical restoration and mental education.

The fourth child in this group of four, is the very mild case, exemplified by the spastic hemiplegia, for example. His treatment may require surgery or a brace and perhaps simple exercises which can easily be carried out at home. He is capable of attending a regular school and presents almost no problem.

In conclusion, it can be stated that the general future for reclamation of cerebral palsy is much brighter as our knowledge of differentiation of the various types develops. It also clearly indicates that, surgical and rehabilitation therapy (such as physical therapy, occupational therapy and speech therapy), and drugs will all play a definite but specific part in the various types.

Posture. A. B. Appleton.
Practitioner 156:55 (Jan.) 1946.

No attempt can be made here to embark on the wide subject of correction, i. e., of remedial treatment. It must suffice to draw attention to a few salient points. The primary site of disturbance must be ascertained. "Round shoulders" as a rule consist mainly in an undue flexion in the upper part of the thoracic spine. Again, the constant adoption of some posture may lead to changes in the degree of passive insufficiency in muscles; thus the use of high heels leads to an increase of the passive insufficiency of the gastrocnemius muscles and this may in turn produce strain on the arches of the foot if the high heels are suddenly discarded. If the shoulders are allowed to fall forward the pectoralis muscle shortens and if attempts are then made to assume a "good" posture without correcting this secondary defect there will be a development of an unusual posture elsewhere, e. g., a lordosis or even a pronation of the foot. If a subject with a long curved back tries to straighten himself without guidance he will bring his head up by a forward displacement of the pelvis and a backward sway above the pelvis. Thus an important problem in the correction of postural deviations consists in avoiding the development of still other postural disturbances.

It must be emphasized that the general and detailed forms of the body are highly individual features, which render it impossible for all persons to assume identical attitudes. There is, further, good reason to believe that an attempt to approximate to a single standard correct pattern of posture is undesirable from the aspect of functional efficiency. As Medea said of the search for the Golden Fleece, "the Golden Fleece may not be so valuable as you have thought." The search for the one correct and perfect posture may be even more difficult than that for the Golden Fleece. It can be stated, however, that certain postural variants are known to be caused by abnormal conditions in the body or by abnormal habits of life; and again, certain postural variants tend to the production of disabilities of various kinds. These can be ascertained, and further investigation should permit the determination of what is a "fault" in posture, and what are the limits within which a posture may correctly be termed "good."

Thrombophlebitis and Phlebothrombosis. Lawrence L. Hobler.
New York State J. Med. 46:179 (Jan. 15) 1946.

It is important from etiologic, prognostic and therapeutic standpoints to distinguish between the two major types of intravenous clotting: thrombophlebitis and phlebothrombosis. Ochsner and DeBakey define thrombophlebitis as a partial or complete venous occlusion by an intravascular clot which is associated with and dependent on inflammation of the vein wall. They define phlebothrombosis as a partial or complete venous occlusion by an intravascular clot which is unassociated with inflammation, the clot remaining loosely attached to the vein wall.

The most important phase of treatment is in the prevention of these conditions or prophylactic treatment. It is well stated that the greatest single factor favoring thrombus formation in the lower extremity is the sudden bed confinement of a previously ambulatory older person without the benefit of exercise or the aid of gravity in the maintenance of an efficient venous circulation. The obese patient should have preoperative reduction of weight if possible. Varicose veins should be treated, if possible, in the preoperative period and in the postoperative period should have

Ace number 8 bandages applied. Smoking should be reduced pre- and postoperatively. The patient's extremities, during and following surgery, should be kept warm. Some authors routinely recommend the use of a heat cradle. Tight abdominal binders should not be used. Dehydration should be avoided and fluid balance well maintained. Ileus should be prevented or reduced as quickly as possible. Active motion of the legs should be instituted early. The patient should be gotten out of bed as soon as is compatible with his general condition and the surgery which has been done. The gradual reduction of the postoperative bed confinement period in recent years has markedly decreased the incidence of thrombophlebitis as well as decreasing the disability period following surgery. Fowler's position should be modified by having the legs elevated. The latter will increase the amount of flexion of the thighs on the abdomen.

The Management of Rheumatoid Arthritis. Francis Bach.

Brit. J. Phys. Med. 8:170 (Nov.-Dec.) 1945.

In St. Stephen's Hospital the rheumatism unit is under the control of the physicians and orthopaedic surgeon. The occupational therapist carries out the remedial diversional work prescribed for patients in the wards and for out-patients and when they are ready for vocational training he selects the kind of training suitable to the individual. Physical therapists carry out physical treatment and supervise remedial exercises. They give electrotherapeutic and hydrotherapeutic treatment, massage and so forth. They apply splints and slings when these are prescribed. Food is carefully regulated by the dietitian and the medical treatment is supervised by the ward sister. The radiologic department and the pathologic laboratory play an essential part in differential diagnosis. The various members of the team combine to treat the patient as a whole individual and not as a collection of separate parts. Part of the team also are the dental, the nose, throat and ear and other specialists.

Rehabilitation of Patients Paralyzed Below Waist. D. Munro.

New England J. Med. 233:453 (Oct. 18) 1945.

Munro asserts that a patient with a spinal cord or cauda equina injury who is intelligent and cooperative and has the use of the shoulder, arm and hand muscles can be made ambulatory, can have such control of the bladder and bowels as to sleep through the night without either getting up or wetting himself, can carry out ordinary activities throughout the day without soiling himself with feces or having to evacuate his bladder oftener than once every three hours, can lead a normal social life and can earn a living. This paper is the first of a series that describes certain therapeutic procedures that have made the attainment of these end results possible. The author has performed a bilateral dorsolumbar anterior rhizotomy on 10 patients. This bilateral intraspinal division of the anterior roots of the eleventh thoracic through the first sacral spinal nerve is recommended as a means of changing a spastic to a flaccid paraplegia in patients with an anatomic transection of the spinal cord at any point between the second thoracic and the second sacral segment preliminary to making the patients ambulant and to providing them with complete twenty-four hour control of micturition so that they may again become active members of their community and be self supporting. Because this operation is a permanently destructive one, the indications for performing it should never be considered lightly. For the present, at least, it should be strictly limited to patients in whom the spinal cord is anatomically transected and in whom all neural connections between the cut surfaces of the cord have been destroyed.

Physical Medicine in the Army. Its Effect on Civil Practice. J. W. T. Patterson.

Brit. J. Phys. Med. 8:163 (Nov.-Dec.) 1945.

Successful rehabilitation depends on a thorough coordination of all remedial measures, from the bedside, through ambulatory convalescence and right up to final reinstatement.

Practitioners of civil medicine, forced to view as an urgent problem the admission of patients to hospital wards, on account of the shortage of beds, must learn that the reduction of the period of convalescence is an equally urgent matter both from the point of view of industry and from that of the patient's economic circumstances.

The medical profession must be prepared to study and disseminate knowledge on what are the most effective measures for rapid and complete restoration after disability, and must be prepared to condemn all personal idiosyncracies in regard to methods which are proved to be wasteful and less than fully effective.

Successful rehabilitation demands a thorough knowledge of all operations involved in the employment for which the person is being prepared.

Successful rehabilitation involves the rehabilitation of the whole man. It is quite hopeless to devote the whole of one's attention to the physical disability and do nothing about the psychologic factors which may be involved.

It would seem to be important that the profession of medicine should busy itself now about the investigation of job analysis from a medical point of view, so that, among other considerations, its rehabilitation work shall be more purposeful and more scientific.

Medicine must be prepared to advise on the capacity in which a permanently disabled person may be most adequately and usefully employed.

It is not sufficient that a man shall be trained for any kind of new avocation. He must be trained for an evocation which will employ him to the optimum, for this is of advantage both to the man himself and to production generally.

Apart from the rehabilitation of the disabled and correct placement in employment there are other important questions which need emphasis.

The medical profession must be roused to take a practical interest in physical education.

The Effect of Daily Electrical Stimulation of Normal and Denervated Muscles Upon Their Protein Content and Upon Some of the Physicochemical Properties of the Protein. Ernst Fischer, and Virginia W. Ramsey.

Am. J. Physiol, **145**:586 (Feb. 1) 1946.

Daily electrical treatment of denervated rabbit muscles is effective in retarding weight loss and deterioration of muscle protein. Treatment applied to a leg in flexed position, so that the muscle contracts against high resistance during stimulation, is much more effective than treatment in an extended limb position, in which the muscle contracts freely against no or little resistance.

With the same type of electrical stimulation, a training effect upon normal muscles was produced only if the stimulation was applied in the extended position. However, even under this condition, the training effect was restricted to an increase in muscle weight, and no changes in the protein composition became apparent.

Orthopaedic Lessons of the War. W. Rowley Bristow.

J. Roy. Army M. Corps **85**:275 (Dec.) 1945.

Many surgeons are still not convinced that early knee movement is necessary in treating a fractured femur, but there can be no two opinions about its value in the management of injuries of the fingers and hand and, to a less extent, the foot.

There has been a great advance in treatment, both in the British and American Armies, from the appreciation of the fact that a splinted hand is likely to become a stiff and useless hand. It was common in the early days of the war to meet with hands immobilized in plaster following a fracture of a metacarpal or a phalanx. It was routine to immobilize the foot and leg following a fracture of the os calcis.

A fractured third metacarpal, for instance, splinted as it is by a normal bone on either side, requires protection but surely not an arm and hand and fingers encased in plaster of paris. Yet this was a common phenomenon in the early days of the war.

The gospel of early movement for the hand and fingers was finally recognized and its appreciation has saved many limbs from long hospitalization and from disaster. It is one of the lessons which the orthopedic surgeons preached incessantly. In some hospitals when a patient left with his arm in plaster following an open fracture of the elbow, written on his plaster were the words: "Keep your fingers moving."

It should be put on record that the masseuses who served overseas played a big part in helping to carry out this policy of early movement and rehabilitation. The massage corps did grand work. They stimulated and encouraged patients to try to use their muscles and joints in a way which the overworked M.O. could not do, and just as the Nursing Sisters are deservedly praised for their work in forward areas, so should the physiotherapists work be equally acknowledged.

Early movement improved the results of the os calcis fracture, never so common as in this war as the result of mine explosions. In the Centres, plaster fixation was generally given up and replaced by rest with the foot elevated on a Braun's frame for four weeks, with the fracture reduced as far as possible, and movement of the forefoot and midtarsus encouraged. No weight-bearing for some sixteen weeks became the standard method. Under the fixation scheme the disability of the fracture was complicated by the adhesions and joint fixation of the whole of the tarsal joints.

Objectors to Electric Shock Treatment Are Refractory to Its Therapy. Hirsch Loeb Gordon.

New York State J. Med. **46**:410 (Feb. 15) 1946.

Opponents of shock treatments are divided into two groups: (a) Negativists, comprising catatonics in the full flourish of their symptoms, who resist shock treatment or any other treatment or enforced guidance; (b) Shock objectors, asthenic and slender, as the catatonics, delusional, hallucinatory, and occasionally depersonalized, neat, well oriented and in good contact, who offer no physical resistance to shock treatment but try to persuade the therapist with ardent pleas, before every application, not to submit them to these treatments because they are "not in need of them."

While the catatonic negativists are the greatest benefactors from electric shock treatment, the group of shock objectors is completely refractory to it.

The astonishing fact that the induced electric energy, which creates a veritable electric storm in the cranium and throws the entire body into powerful convulsions, blacking out consciousness at the same time, fails to affect the psychotic patterns of those who object to them in the waking state leads the author to review various correlations between nerve-cell states and activities and mental processes and to postulate the following.

The curative moment in the procedure of electric shock treatment is the period of fatigue and relaxation following the initial tension reaching its highest limits, nervous and mental diseases being a state of irritable tension.

To make shock objectors benefit from electric shock treatments, psychotherapy must precede the initiation of the course.

The Medical Career of Jean-Paul Marat. H. P. Bayon.

Proc. Roy. Soc. Med. **39**:39 (Nov.) 1945.

The "Friend of the People" has been considered an eminent physician or a low-down quack, according to whether the writer admires or condemns Marat's political activities from 1790 to 1793; for it was only then that he became known as the "tiger that would have drunk the blood of his mother from the skull of his father." Previous to these revolutionary years, Jean-Paul was a whole-hearted admirer of Jean Jacques Rousseau (1715-78) that is, a mild humanitarian—in

theory. To obtain a complete picture, reference must be made to Marat's works on heat, light and electricity, since he was a keen scientific experimenter during most of his life.

Peripheral Neuritis. Polyneuritis, Multiple Symmetrical Peripheral Neuritis. F. M. R. Walshe.

Practitioner **156**:25 (Jan.) 1946.

Despite the strident clamour of those who find in vitamin administration the answer to so many therapeutic problems, it cannot be overemphasized that the two essentials in the treatment of polyneuritis are rest and a nutritious and abundant diet. It goes without saying that when an exogenous poison is in question, such as alcohol, abstention from it is essential and no half-measures should be tolerated.

If, despite the consistent disillusionments of the past twenty years, it is desired to give vitamin B, the whole complex should be given, and not B_1 (aneurin, thiamin) alone. It may be given as half an ounce daily of brewer's yeast and supplemented by thiamin parenterally or by mouth, and in large doses. The author's view is that strychnine is more effective, given in doses of 1/30 to 1/15 of a grain by mouth, twice or thrice daily. Pain may be relieved by aspirin and codeine, or phenacetin. While the limbs remain painful it is best to be content with seeing that they are kept in good position by sandbags and splinting, massage and active exercises being given when the acute and advancing phase of the illness is past. The necessity of an initial period of rest in even the mildest cases cannot be overstressed. This will often prevent the further development of the weakness. Mobilization of the patient must await the beginning of improvement and the settling of the heart rate to normal limits. With these measures a good result can be looked for.

Fractured Patella. An Analysis of 54 Cases Treated by Excision. R. Brooke.

Brit. M. J. **4441**:232 (Feb. 16) 1946.

Excision is advocated both for transverse and for comminuted fractures. The details of the operation and the after-treatment have been described before. It is difficult to understand why excision is accepted as a satisfactory measure in the case of comminuted fractures, but caution is shown in advocating its use in the transverse variety.

It must be appreciated that the injury is really a major injury to the knee-joint and, as in all such injuries, quadriceps wasting will be rapid. Quadriceps insufficiency develops during a period not of weeks but of days, and half an inch of wasting in a few days may take months of physical therapy to regain after the operation. For this reason early operation is essential, usually on the fifth day after the accident, or as soon as the skin over the operation site is sufficiently healthy. For a similar reason the patient must be got up early after the operation, and, if a wood splint is used, this can be done with impunity on the fifth or sixth day, the patient walking with two sticks or between two chairs, using his own quadriceps actively, but not at first bending the knee. Back splints or plaster must be avoided at all costs. Postoperative physical therapy is not as a rule necessary, but may be used when required.

Circumscribed Post-Traumatic Osteoporosis of the Lower Ends of the Radius and Ulna. Joseph Buchman.

Am. J. Surg. **71**:272 (Feb.) 1946.

It therefore appeared to the author that the patient was suffering from a diffuse post-traumatic osteoporosis of the entire carpus and adjacent bone structures superimposed on a previously existing circumscribed post-traumatic osteoporosis of the semilunar bone, otherwise known as Kienboch's disease. Immobilization in a circular plaster of paris bandage from the metacarpophalangeal joints to the elbow was advised and applied from time to time over a period of eighteen months from the date of the accident. Radiographic examination demonstrated that the diffuse punctuate osteoporosis had disappeared. Gradual mobilization of the wrist and physical therapy were advised and instituted. A further roentgenographic study two years after the accident demonstrated the above described changes more clearly. Clinically, however, there were residual changes such as pronounced limitation of motion, pain on extremes of motion, tenderness and weakness which were indicative of arthritic changes. The prognosis was therefore poor even though the diffuse post-traumatic osteoporosis had subsided.

Pulse Reaction to Performing Step-Up Exercise on Benches of Different Heights. Edwin R. Elbel, and Earl L. Green.

Am. J. Physiol. **145**:526 (Feb.) 1946.

In normal subjects, following the step-up exercise, for periods of 30 or 60 seconds, on benches of 12 to 20 inches in height, the pulse rate taken for 30 seconds beginning one minute after exercise are practically the same for the various heights of the benches and the duration of exercise.

The pulse rate for the 30 seconds immediately following the stepping up exercise depends upon the height of the bench and the duration of the exercise. After 30 seconds of exercise, the average increment is 3.7 beats per minute greater for each additional two-inch increase in the height of the bench. After 60 seconds of exercise, the increment becomes 5.6 beats per minute greater for each additional two-inch increase.

The height of the bench and the duration of the step-up exercise as used in this study do not significantly alter the pulse rate if the pulse record is taken one minute after exercise.

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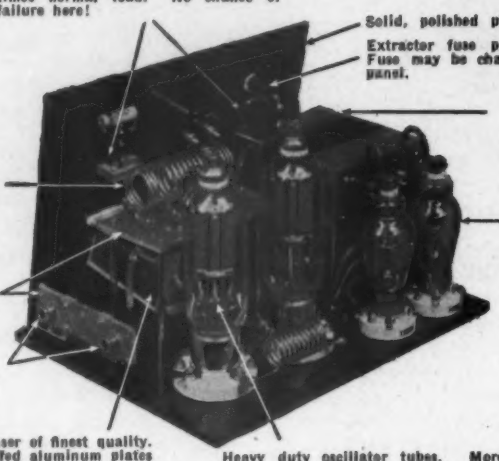

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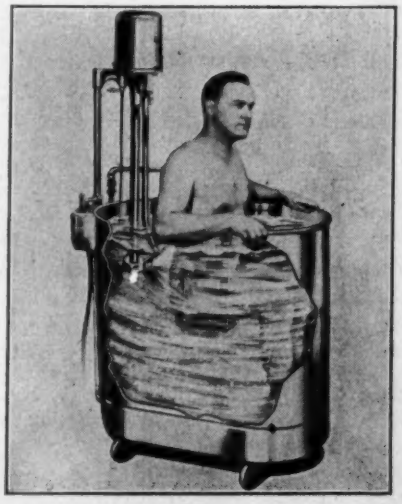

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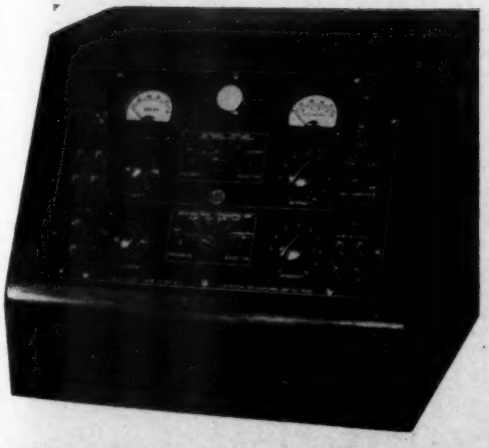

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APPROVED SCHOOLS FOR PHYSICAL THERAPY TECHNICIANS

Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	Medical Director	Technical Director	Regular Course: Entrance Requirements*	Length in Months	Classes Start	Tuition	Certificate, Diploma, Degree
Children's Hospital, Los Angeles	Samuel S. Mathews	Lily H. Graham	a-b-o	12	FebAug	$200	Diploma
College of Medical Evangelists, Los Angeles[1]	Fred B. Moor	A. H. Carlson	c	12	JanJuly	$215	Cert. or Degree
University of California Hospital, San Francisco[1]	Frances Baker	Margery L. Wagner	e	12	MarOct	$150	Certificate
Stanford University, Stanford University, Calif.[1]	Wm. H. Northway	Lucille Daniels	a-b-d[2]	10	Quarterly	$409	Cert. or Degree
Northwestern University Medical School, Chicago	John S. Coulter	Gertrude Beard	a-b-d	9	JulyOct	$200	Certificate
State University of Iowa Medical School, Iowa City	W. D. Paul	Olive Farr	b-e	12	Dec	None	Certificate
University of Kansas School of Medicine, Kansas City[1]	Gordon M. Martin	Ruth Monteith	a-b-c[2]	10	FebSept	$50[4]	Cert. or Degree
Bouvé-Boston School of Physical Education, Boston	Arthur L. Watkins	Constance K. Greene	c[3]	36	Sept	$400 yr.	Degree
Harvard Medical School, Boston	Eugene Eppinger	Janet B. Merrill	a-b-d	9	Varies	$300	Certificate
Boston University, College of Physical Education for Women, Sargent College, Cambridge, Mass.	Louis Howard	Adelaide L. McGarrett	H.S.	36	Oct	Varies	Degree
University of Minnesota, Minneapolis[1]	Miland E. Knapp	Sara E. Kollman	a-b	12	June-Sept		Cert. or Degree
Barnes Hospital, St. Louis	F. H. Ewerhardt	Beatrice F. Schulz	a-b-c	9	Oct	$200	Certificate
St. Louis University School of Nursing St. Louis[1]	Alex. J. Kotkis	Sr. M. Imelda	a-b-c[3]	9	Sept	$250 yr.	Cert. or Degree
Columbia University, New York City[1]	Wm. B. Snow	Josephine Rathbone	a-b-c	10	FebSept	$480	Certificate
New York University School of Education, New York City[1]	Geo. G. Deaver	Elizabeth Addoms	a-b-c	9	Sept	$450	Cert. or Degree
Duke Hospital, Durham, N. C.[1]	Lenox Baker	Helen Kaiser	a-b-c	12	Oct	$200	Certificate
D. T. Watson School of Physiotherapy, Leetsdale, Pa.[1]	Jessie Wright	Kathryn Kelley	a-b-d	12	Oct	$200	Diploma
Graduate Hosp. of the Univ. of Pennsylvania, Philadelphia[1]	Geo. M. Piersol	Katharine S. Sutherland	a-b-c	12	Sept	$200	Certificate
University of Texas School of Medicine, Galveston[1]	G. W. N. Eggers	Ruby Decker	a-b-c	9	Jan.	$100[4]	Certificate
† Baruch Center of Physical Medicine and Richmond Professional Institute, Richmond, Va.[1-5]	F. A. Hellebrandt	Josephine J. Buchanan	a-b-c	12	Sept	$200[4]	Cert. or Degree
University of Wisconsin Medical School, Madison[1]	Elizabeth Grimm	Margaret A. Kohli	a-b-c	9	Sept	Varies	Certificate

* Courses are so arranged that any of the entrance requirements will qualify students for training. a = Graduation from accredited school of nursing; b = Graduation from accredited school of physical education; c = Two years of college with science courses; d = Three years of college with science courses; e = Coll. deg., science; H. S. = High school graduation.

† Also six-month emergency course.

1. Male students admitted.

2. High school graduates accepted for four-year course leading to A.B. degree; students admitted quarterly and tuition is $143 per quarter.

3. High school graduates admitted to four-year college course.

4. Non-residents charged additional fee.

5. Limited to Navy nurses, the Medical College of Virginia offers a six-month emergency course which is followed by six months of clinical practice in a Navy installation. It is an emergency arrangement for 1946 and will be discontinued with the beginning of the 1946-47 school year. Tuition is the same as for the regular course. Certification will be granted at the end of the apprenticeship.

APPROVED SCHOOLS FOR OCCUPATIONAL THERAPY TECHNICIANS

Council on Medical Education and Hospitals of the American Medical Association *

NOTE: The duration of the course is expressed in academic years and in most schools the accelerated curriculum is being followed.

Name and Location of School	College Affiliation	Duration of Course	Classes Start	Entrance Requirements	Tuition Per Year	Certificate, Diploma, Degree	Graduates in 1944
University of Southern California, 3551 University Ave., Los Angeles	University of Southern California	2 yrs. 5 yrs.	Fall term Every semester	College deg. High sch.	$330 $330	Certificate B.S.&Cert.	3
Mills College, Oakland, Calif.	Mills College	5 yrs.	FebSept	High sch.	$475	Cert. & Deg.	None
San Jose State College, San Jose, Calif.	San Jose State College	3 yrs.	Every quarter	1 yr. coll. High sch.	$21 $21	Certificate Degree	5
University of Illinois College of Medicine, 1853 W. Polk St., Chicago	University of Illinois	4½ yrs.	Varies	High sch.	$80	B. S.	None
University of Kansas, Lawrence	University of Kansas	4½ yrs.	Every semester	High sch.	$25	B. F. A. & Cert.	1
Boston School of Occupational Therapy, 7 Harcourt St., Boston	Tufts College	3 yrs. 5 yrs.	Varies Sept	1 yr. coll. High Sch.	$400 $400	Diploma Diploma & Deg.	58
Kalamazoo School of Occupational Therapy, Western Michigan College of Education, Kalamazoo	Western Michigan College of Education	3 yrs.	FebOct	1 yr. coll.	$76[1]	Dipl. & B. S.	14
Michigan State Normal College, Ypsilanti	Michigan State Normal College and Univ. of Michigan	5 yrs.	SeptFeb June	High sch.	$67	Cert. & Deg.	7
St. Louis School of Occupational and Recreational Therapy, 4567 Scott Ave., St. Louis	Washington University	3 yrs.	Oct	2 yrs. coll.	$350	Dipl. & Deg.	17
Columbia University, 630 W. 168th St., New York City	Columbia University College of Physicians and Surgeons	3 yrs.	FebSept	2 yrs. coll.	$380	Cert. & B. S.	23
New York University School of Education, 100 Washington Sq. E., New York City	New York University	4½ yrs.	Quarterly	High sch.	$475	Cert. & B. S.	4
Ohio State University, Columbus	Ohio State University	4½ yrs.	Quarterly	High sch.	$75	Degree	3
Philadelphia School of Occupational Therapy, 419 S. 19th St., Philadelphia	University of Pennsylvania	3 yrs.	Nov.	1 yr. coll.	$400[2] $400[2]	Diploma Degree	65
Richmond Professional Institute, 901 W. Franklin St., Richmond, Va.	College of William and Mary	3 yrs.	FebSept	1 yr. coll.	$220	Certificate	5
Milwaukee-Downer College, Dept. of Occupational Therapy, 2512 E. Hartford, Milwaukee 11	Milwaukee-Downer College	3 yrs. 5 yrs.	Sept Sept	1 yr. coll. High sch.	$250 $250	Diploma B. S. & Diploma Certificate	26
Mount Mary College, 2900 Menomonee River Dr., Milwaukee	Mount Mary College	5 yrs.	Sept	High sch.	$210	B. S.	7
University of New Hampshire, Durham, N. H.	Univ. of New Hampshire	4½ yrs.	SeptFeb	High sch.	.....	Degree	None
University of Toronto, Dept. of University Extension, Toronto, Ont., Canada	University of Toronto	3 yrs.	Sept	1 yr. coll.	$188	Diploma	34

1. Non-residents charged additional fee.
2. $400 per yr. for each of first two years; $200 for third yr.
3. $400 per yr. for each of first four years; $200 for fifth yr.

* Reprinted in part J. A. M. A. 127:848 (March 3) 1945.

FEATURES

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OPPORTUNITIES

WANTED — PHYSICAL THERAPISTS FOR THE FOLLOWING: (a) Department of physical therapy, 12-man group; winter resort town, Southwest. (b) To take full charge of department in 250-bed general hospital; treatments average 10,000 annually; middle western metropolis. (c) To take charge of department, one of the leading hospitals in the Chicago area; man or woman. (d) To take charge of department of large hospital located in the Detroit area. (e) To become associated with 15-man clinic; all specialties represented; preferably some one particularly well qualified in administering fever therapy; Rocky Mountain area. (f) Chief physical therapist; small hospital for crippled children; institution has own farm and dairy; beautiful location, South; $3600, complete maintenance. (g) Consultant in physical therapy, crippled children's division of organization, state department of public welfare; duties consist of direct treatment to children in four hospitals as well as consultant service to public health and hospital nurses including supervising physical therapist; salary, $2400-$2800.

WANTED — Physician qualified in physical medicine to organize and direct department of physical therapy, 10-man clinic having large compensation and orthopedic service.

SITUATIONS WANTED

Physician, well qualified and experienced in physical medicine; Veteran World War II; four years, director of physical therapy and physical therapy department, large teaching hospital; military service confined to directing department of physical medicine.

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For further information, please write,

BURNEICE LARSON, Director, Medical Bureau, Palmolive Building, Chicago 11.

The Silver Anniversary year of the National Society for Crippled Children and Adults marks the thirteenth annual sale of Easter Seals for crippled children as a special occasion.

Services to the crippled are supported by voluntary contributions to the state Societies during the month before Easter, by the purchase of Easter Seals. Based on valid, unfilled need, these services are for crippled persons of all ages, races and creeds. Funds are used for services which do not duplicate the work of other private or public agencies.

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Physical Therapist, male or female. Department established two years ago in 150 bed general hospital. New equipment, employing one technician. Expansion program planned for hospital and this department. Located in industrial town. Salary $200.00 per month and meals. Fairmont General Hospital, Fairmont, W. Va.

MEETINGS OF INTEREST TO THOSE IN THE FIELD OF PHYSICAL MEDICINE

In these columns will be published information about meetings of interest to those in the field of physical medicine. New data should be sent promptly to the office of the Secretary, 2 E. 88th St., New York 28, N. Y.

American Congress of Physical Medicine, 24th Annual Session, Hotel Pennsylvania, New York, September 4, 5, 6 and 7, 1946; **Instruction Course** to be held during the meeting; Dr. Richard Kovács, 2 East 88th Street, New York 28, Secretary. See announcement elsewhere this issue.

Eastern Section, American Congress of Physical Medicine, Walter Reed General Hospital, Washington, D. C., Saturday, April 13. Dr. G. J. Barger, 1125 Buchanan Street, N. W., Washington 11, D. C., Secretary.

Midwestern Section, American Congress of Physical Medicine, Chicago, Illinois. Watch for announcement of date and program. Dr. C. O. Molander, Michael Reese Hospital, Chicago, Secretary.

National Rehabilitation Association, Hotel La Salle, Chicago, Illinois, May 13, 14 and 15, 1946. Mr. H. Earle Correvont, Director of Vocational Rehabilitation for Michigan, Chairman of Program Committee.

New York Society of Physical Medicine; meetings on first Wednesday, from October to May, New York City; Dr. Madge C. L. McGuinness, 51 East 87th Street, New York 28, Secretary.

The Pennsylvania Academy of Physical Medicine; meetings at the Philadelphia County Medical Building, 21st and Spruce Streets. For 1946 schedule inquire of Secretary, Dr. Harold Lefkoe, 1824 Spruce Street, Philadelphia 3.

Southern California Society of Physical Medicine, Secretary-Treasurer, Dr. Clarence Dail, 802 Acacia Street, San Gabriel, Calif.

National Council on Rehabilitation; Fourth Annual Meeting, Ritz-Carlton Hotel, New York City, April 24 and 25, 1946; Executive Director, Chauncey S. Truax, 1790 Broadway, New York 19, N. Y.

American Physiotherapy Association, Annual Conference, June 16 to 22, 1946, Blue Ridge, N. C. Mildred Elson, Executive Secretary, 1790 Broadway, New York 19, N. Y.

American Occupational Therapy Association, Congress Hotel, Chicago, August 11 to 15, 1946. Mrs. Meta R. Cobb, Executive Secretary, 33 West 42nd Street, New York 18, N. Y.

INSTRUCTION COURSE

In Conjunction with the

24th Annual Scientific and Clinical Session

AMERICAN CONGRESS OF PHYSICAL MEDICINE

September 4, 5, 6, 7, 1946

HOTEL PENNSYLVANIA **NEW YORK, N. Y.**

	Wednesday September 4	Thursday September 5	Friday September 6
8 A.M. to 9 A.M.	(1) Peripheral Nerve Injuries (Physiologic Studies) (2) Anatomical Reasons for Foot Strain (Treatment)	(7) Physiologic Basis for Therapeutic Exercise (8) Fundamentals of Electricity as Applied to Physical Medicine	(13) Rehabilitation of Industrial Injured (14) Physical Therapy to Injuries of the Hand
9 A.M. to 10 A.M.	(3) Pain (Types: Neurotic, Radiating or Referred, Causalgic, Ischemic) (4) Low Back Pain (Anatomical and Mechanical Basis	(9) Reconditioning in Certain Medical and Surgical Conditions (Cardiacs, Chest Surgery) (10) Rehabilitation of the Severely Disabled	(15) Electrical Stimulation of Denervated Muscle (With Actual Demonstration on a Model) (16) Use of Physical Therapy Following Various Fractures of the Extremities
1 P.M. to 2 P.M.	(5) Functional Anatomy of the Shoulder Girdle (6) Functional Anatomy of the Hand	(11) Essentials of Muscle Reeducation (12) Lecture and/or Demonstration (Crutch Walking)	(17) Prescription Writing in Physical Medicine (18) Hydrotherapy and Spas (Present Status)

The course is intended primarily for physicians but a limited number of the members of the American Registry of Physical Therapy Technicians will also be admitted.

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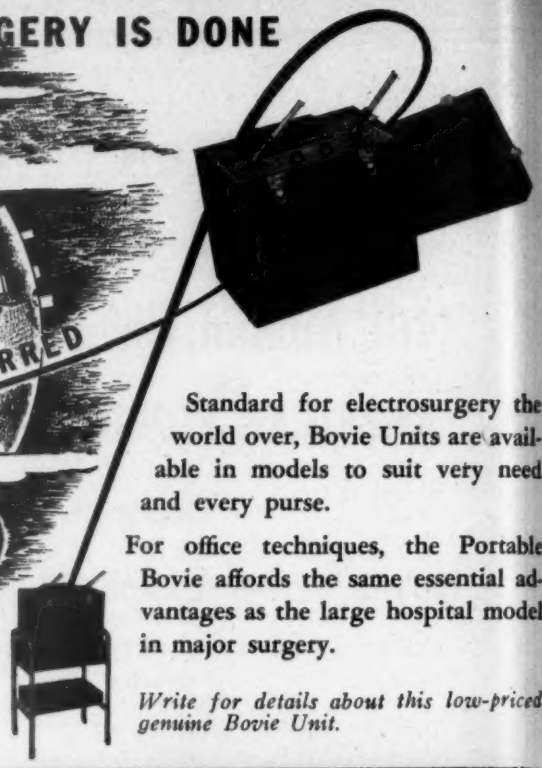

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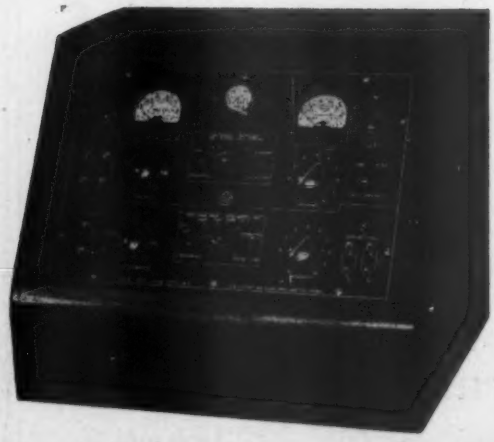

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AMERICAN CONGRESS OF PHYSICAL MEDICINE

WESTERN SECTION

JUNE 27 and 28, 1946

SAN FRANCISCO

The officers of the Western Section of the Congress announce the presentation of a scientific program in San Francisco on Thursday and Friday, June 27th and June 28th.

The meetings will be held at the Stanford University Hospital on June 27th and at the University of California Hospital on June 28th.

SECTIONAL OFFICERS

CLARENCE DAIL, M.D.
Chairman, Western Section

WILLIAM H. NORTHWAY, M.D., Secretary
Stanford University Hospital,
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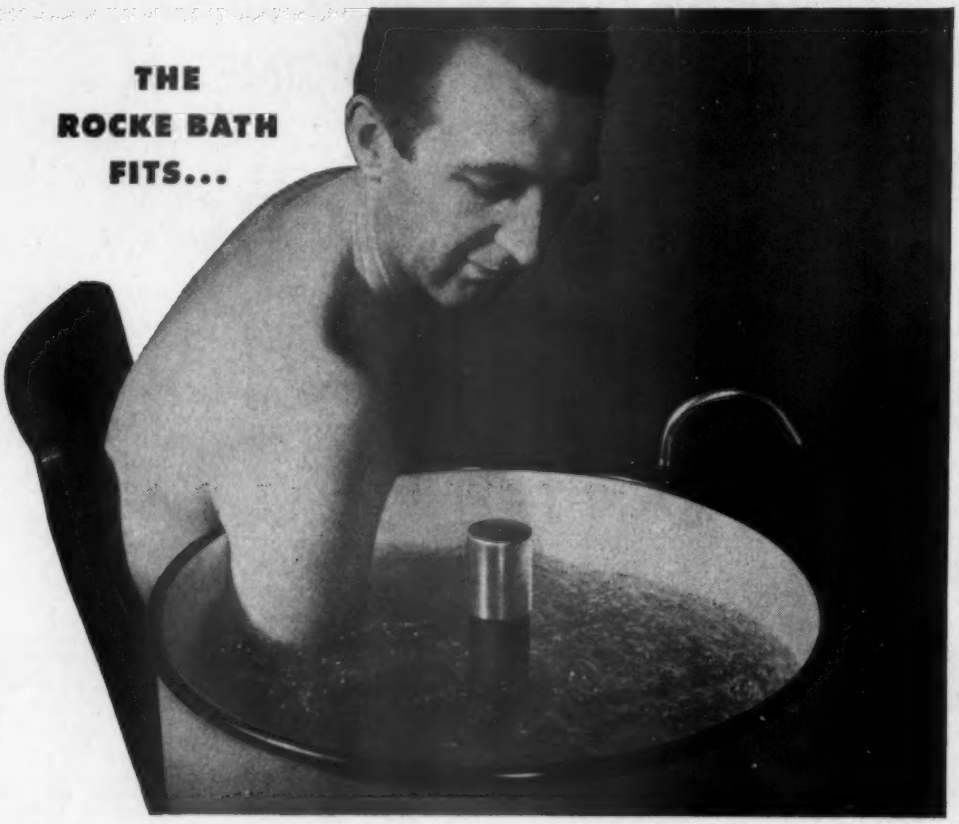

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